Laboratorio Expo

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Sustainability as an operational concept for tomorrow

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Laboratorio Expo

Laboratorio Expo è un progetto di Expo Milano 2015 e Fondazione Giangiacomo Feltrinelli curato da Salvatore Veca. Laboratorio Expo è dedicato alla riflessione scientifica sui temi della sostenibilità ambientale ed etica, sulla cultura del cibo, lo sviluppo sostenibile e sul rapporto città/cittadini e si propone di mettere in dialogo aspetti culturali, antropologici, economici e sociali legati alle tematiche di Expo Milano 2015.

IL TESTO

Science Agreement è il frutto di un laboratorio collettivo in cui il gruppo di Laboratorio Expo propone il risultato di una riflessione sulla sostenibilità, termine che è entrato nel nostro vocabolario e che svolgerà un ruolo significativo nel nostro futuro, attraverso un'analisi interdisciplinare del suo significato e impatto sulle nostre vite.

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Executive summary

The scientific community has an intellectual duty to question itself on issues of radical importance and the responsibility to identify what is the problem, opening up space for an exchange of ideas and knowledge on the important theme "Feeding the planet". Several issues are at stake. Firstly, the need to increase the availability of quality food for a growing population, confronting the dynamics of access and distribution of food resources have at a global level and developing production systems that are at the same time both efficient and fair. Secondly, the issue of environmental sustainability: it is crucial to identify solutions that will ensure energy for all, by also questioning the impact that our food preferences have on the environment. Sustainability is concerned with lifestyles, with the territories, with traditions and the multifaceted and ever changing nature of food cultures.

In this socio-economic context, the goal is to identify areas of intervention in which it is urgent to address the challenge of social sustainability: protection of collective goods, redistribution of wealth, new mechanisms of participation; and to support, in a dimension that opposes the dynamics of strongly unequal contemporary growth through social innovation and new forms of urban governance.

From these pressing issues, the researchers involved in the project LabExpo, have identified twelve main questions that need to be addressed in order to move toward a more sustainable planet. These questions are very diverse, ranging from food security to governance practices, and address the many facets of sustainability in contemporary societies.

The main questions are the following:

Food security

The latest estimates by the United Nations report that 805 million people are chronically undernourished, thus highlighting food insecurity as a widely spread phenomenon caused by complex issues strictly intertwined with another compromising availability, access, utilization and/or stability of food resources. In order to tackle such issues, single actions taken by stakeholders operating independently are not sufficient, nor effective. Instead, coordination is central to create an environment conducive to the implementation of tailored measures ensuring food security. In this regard, social participation, inclusion of vulnerable groups, and the adoption of an integrated approach taking count of technical, political and social aspects, are paramount. Particularly, agriculture is a game changer in addressing food insecurity and hunger worldwide. Public and private partners at all levels should thus act in concert in order to implement *ad hoc* initiatives both at policy and field level to raise agricultural productivity, promote farm and non-farm activities, strengthen value

chains and access to market, reduce vulnerability to environmental crisis and close the gender gap.

Safe and nutritious food for all

Even when access to food resources is ensured, food security is at risk if those resources are neither nutritious nor safe. Undeniably, all over the world a large portion of the population is dealing with healthy issues related to malnutrition and foodborne diseases. As food safety is strictly dependent on how food is processed, stored and consumed, clearly emerges the necessity of raising awareness, simplifying rules, improving skills and infrastructures, adapting food safety monitoring and management systems in order to guarantee healthy nutritional status worldwide.

Healthy nutritional status is furthermore guarantee by balanced energy and nutrients intake resulting from good care and feeding practices, food preparation, and diversity of the diet. This, combined with the physical activities, determines the nutritional status of individuals. Due to the complex framework, a systemic approach, as nutrition sensitive agriculture and food system programs, are a sustainable-environmentally and socially - and gender-sensitive answer to re-establish a human healthy nutritional status in synergy with the environment worldwide.

The way to future food production

Since the 1960s world population has grown from three billion to more than seven billion. Such a growth came along with a significant increase in food demand requiring the intensification of production processes that gradually led to the depletion and deterioration of finite natural resources. Fertile soils, water, biodiversity and energy have long been mismanaged, which compromised the sustainability of modern production systems and threatened global food security. The need to rethink, design and implement more environmentally sustainable and socially just production systems is thus getting urgent. In this framework, the agroecologic approach appears promising, as it is based on more biodiverse and resilient production systems less dependent on external inputs. Similarly, a more efficient use of water resources, the implementation of innovative and smart solutions for valuing alternative energy sources and reducing agricultural inputs, the definition of strategies to reduce food waste and the inclusion of consumers in designing sustainable production and consumption patterns are increasingly relevant.

Aesthetics of Food and Cultures of the Senses

Likes and dislikes of food are social constructions shaped through the cultural elaboration of the sensorial experience. Taste is a form of social action through which societies discriminate between friends, enemies and guests, building ethnic, class and gender differences. Their transmission from one generation to the other leads to the awareness of who we are and the memory of what we have been: by mean of them, identities and belongings are defined. The issue of taste is a political one: the

homologation and privation processes linked to tasting experience, act as deculturation and dependence patterns. Furthermore, the impoverishment of tastes is not only due to a simplification of flavors, but also to the loss of symbolic dimension, to the inability of creating meaningful relationships, whether "around the table" as much as by the retailers and the producers as well.

Food and Belonging: bodies, territories and agri-cultures

Patterns of food production and consumption are approached by anthropology as tools of identity construction at the collective as well as at the individual level. Following large-scale industrialization of agriculture and agro-business, food cultures have radically changed in southern and northern countries: a disjuncture has imposed more and more between the farmers or those who produce food, the consumers and their territories, as well as between cultures and 'agri/cultures'. In this scenario, emergent and innovative patterns of production, distribution and consumption, are redefining the symbolic and collective dimension of food (Gruppi di Acquisto Soldidale and Des in Italy, Amap in France, seeds banks, rural networks of food security). At the same time a growing number of individuals have become aware of the over determined nature of their alimentary choices and have voiced critical concerns towards the assimilation of aliments void of identitary character, and have embraced a new-found interest in the idea of food as a means to assert identity.

Food Heritage

It is in the category of Intangible Cultural Heritage whose definition is increasingly contested and not adopted by all UNESCO state members that food practices officially enter into the dynamics of heritage institutionalization. Central to the issue of food heritage are the anthropological critics to the notions of *tradition* and *authenticity* as well as the attention given to the process of transmission in the definition of a cultural heritage. Indeed, the challenge posed by the cultural heritage is that of moving from the original etymology of the legal term, which is conceived as private heritage often selectively transmitted from the family through father, towards a notion of cultural heritage which is shared, recognised, consciously and democratically participated in by everybody.

Collective goods

Common resources have an important redistributive function, being a vehicle for direct and equitable access to important means across all socio-economic strata. They also work as a sort of 'social glue', which can contribute to a group's sense of belonging, cohesiveness and cultural resilience. Collective goods are common-pool resources that are de facto used by specific groups in time and space, namely by collectivities at different levels: local, national, regional, global. Collective goods can comprise a variegated list of tangible and intangible items, around which potential conflicts may arise because the protection of access of one collectivity may stand in contrast – and reduce – the access of another one. Protecting collective goods is crucial

for the scope of feeding the planet, yet the challenges to face are many and complex, including large-scale abuses, unclear or unfair definitions of property rights as well as the lack of shared consciousness.

Social sustainability

Inequality is expected to play a major role in the post-2015 development agenda. Situations that create and perpetuate social disadvantage play a major role for access to food and for malnutrition, too. In line with the Human Development Paradigm, social sustainability can be interpreted as the set of circumstances in which large asymmetries of human freedoms and opportunities within and across generations are being avoided. Currently, asymmetries in the world can be traced back to different factors, such as increasing wealth concentrations, inequality of opportunities, or lack of agency and participation. In tackling food insecurity – and in a broader sense social disadvantage – a main challenge is to actively promote shared responsibility: top-down interventions and bottom-up movements involving different actors and complementary actions are both necessary in order to feed the planet. Responsible consumption and production localize global problems; and changes in institutions, policies and practices can globalize local concerns.

Access to energy

Access to modern energy services, intended as access to electricity and to clean cooking facilities, is a fundamental condition for sustainable development, given its key role in the provision of clean water, sanitation, healthcare, reliable and efficient lighting, heating, food security, mechanical power, transport and telecommunication services. A large share of the global population still lacks access to electricity (1.3 billion) and relies on traditional methods and fuels to cook and heat (2.3 billion), with serious danger for health. Reaching the target of universal access to modern energy, while ensuring environmental sustainability and economic development is a great challenge that involves everybody, at all levels: international organizations, governments, firms, civil society and individuals.

Socio-economic development

Socio-economic development has become an issue because continuous economic growth has come to a halt and there are serious threats of decline and stagnation in many western cities. In general, cities face major difficulties in creating economic opportunities in a framework of high competition, shrinking markets and reduced resources. The contributions collected from experts all over the world point to new forms of production in the postindustrial city, in particular a collaborative mode of production based on the sharing of knowledge and skills, which has begun to emerge in several industries. In envisioning the possibilities of economic development, it is important to take into account the debate about the role of these new forms in the future of urban economies. What is certain is that they are emerging thanks to resources and conditions which are peculiar to cities.

Governance

The urban governance processes are progressively losing democratic dimensions and egalitarian substance because of the asymmetric influence of powerful élites, particularly economic ones. The weakening of representative democracy is causing the disaffection of the ordinary citizen from politics institutions. Politics has become a private affair whereby decisions are made through exchanges of favours between the elected and the lobbies. Alongside these tendencies, number of events, processes and phenomena have emerged that, despite not being prevalent, allow for some countertendencies to be registered, showing seeds of change at different levels in the system of urban governance. Some of these phenomena are connected with new technologies and with the role these can have in facilitating inclusive governance Other phenomena are manifested in politics itself, participatory budgets for instance; others concern the role of non-profit organizations or civic society enterprises that promote activities and services that are not provided by the state; others still are connected to urban social movements.

Social cohesion

The issue of social cohesion concerns the need for the city to overcome disruptive features of our "liquid modernity", such as fragmentation and individualization, and, more importantly, increasing inequalities, social polarization, marginalization and exclusion. In the face of these disintegrative processes, we discuss emerging practices of social innovation that aim to respond to unmet social needs through the re-organization of socio-spatial relations, the activation and empowerment of individuals and communities, highlighting their potential to resist and counter these exclusionary and socially corrosive trends.

1. Agriculture, Environmental <u>Sustainability</u> and Food- Nutrition

The EXPO event, focused on the theme "*Feeding the planet, energy for life*", on the one hand puts agriculture, livestock and fisheries under the spotlight by acknowledging their strategic relevance; on the other, it highlights unsolved issues in regard to right to food, malnutrition and environmental impacts of food production. As such, therefore, the Universal Exposition to be held in Milan represents a great opportunity to gather experts, intellectuals, scientists, administrators and policy makers to debate and contribute with innovative ideas dealing with global issues. In this framework, the present document was elaborated. Indeed, in the three following sections, suggestions and contributions received by a pool of international and national experts have been collected and summarized. They have been asked to answer to main questions on issues related to the future of our planet and in particular how to face hunger and poverty, and how to guarantee to all people, at all times, the access to sufficient, safe, affordable and nutritious food for a healthy diet while preserving natural resources for future generations.

The present scenario is characterized by 805 million people suffering from hunger, 2 billion from hidden hunger, more than 500 million from obesity and about two billion from overweight. At the same time as much as 30% food produced is lost or wasted, while the available natural resources (water, fertile soils, biodiversity, energy) are scarce and partially compromised. For the future, the scenario seems to change because food production is not growing at the same ratio as in the past and currently food demand is increasing faster than the food offer; world's population, in fact, keeps growing and requires more animal protein. The arable surfaces are threatened by desertification, urbanization and non-food cultivation, i.e. production of biomass for energy. Modern agricultural systems rely on a small number of species, selected on the basis of productivity. As it is presently structured, agriculture significantly contributes to climate change by greenhouse gases emissions. Moreover, as much as 70% fresh water consumed is due to the agriculture. Therefore, there is the need of rethinking the way we produce. There are different opinions about future agriculture: 1) Sustainable intensification agriculture model is the first proposal. The critical aspect is: how is it possible to reduce water consumption, gases emissions, soils exploitation and biodiversity loss? 2) Agro-ecology model is the second proposal, based on the conservation of natural resources. The critical point of this model is: can it produce enough food for all the populations in the world?

Proposals have been collected for food losses and wastage reduction, as well as for new dietary styles in order to reduce obesity and overweight and non-communicable diseases associated to nutrition imbalances; similarly, new proposals to support developing countries have been reported with the aim of improving their human capital and to ensure the access to appropriate technologies towards the effective achievement of food security based on availability, access, utilization and stability.

Scientific research can give a significant contribution to these issues. Different opinions have been collected on the GMOs. Traditional and advanced technologies can help to face the problems and can help to find a solution. Coordination among the different levels of management (national, regional and local) is required and in any case it is necessary to guarantee a large participation of people in order to share decisions behind plans and programs. We are aware also that the scientific research and innovation transfer to production activities are important, but policies at all levels will be decisive in order to create a conducive environment for the implementation of ad hoc measures addressing food insecurity negative externalities deriving from agriculture. In any case we are confident that disseminating by several scientific events good ideas and proposals suggested by international experts and researchers during and after the universal exposition will positively contribute to raise awareness on these issues and put pressure on international and national policy-makers.

1.1 Food security: what's behind and what's next

The latest figures provided by the agencies of the United Nations report that 805 million people are chronically undernourished and that the vast majority of them (791 million) live in developing countries (FAO, IFAD & WFP 2014). These people are in a condition of food insecurity, as they do not have sufficient nor nutritious food for an active and healthy life (FAO 2009; 1996). Behind these remarkable numeral figures, there are large differences across developing regions, pointing to very different situations characterized by specific issues. Eastern and South-Eastern Asia, for example, have already achieved the first Millennium Development Goal, MDG1 (UN 2014), as well as Latin America and the Caribbean. Similarly, the Caucasus and Central Asia are on track to reach MDG1[1] by 2015 (UN 2014). By contrast, sub-Saharan Africa and Southern and Western Asia have reported insufficient progress, with the former becoming home to more than a quarter of the world's undernourished population (UN 2014).When focusing on ensuring food security, four dimensions - namely *availability*, *access*, *stability* and *utilization* (FAO 2009; 1996) - have to be considered in order to provide a comprehensive picture.

Availability is the first pillar necessary - but not sufficient - to guarantee food security. Most often, food availability has been associated with the concept of producing enough food, but it does not actually refer only to food quantity: instead, it also touches upon food quality and diversity. Nowadays the lack of availability persists, even if global food production has kept well ahead the global demand for food over the past half-century. This is because there are several interconnected pressures affecting food availability that go beyond an increasing number of people to be fed (FAO, IFAD & WFP 2014). The balance between food availability and food demand, in fact, is highly affected by environmental factors linked with global trends, such as those related to climate change, biodiversity loss, water resources depletion and deterioration, land use change and increasing release of pollutants in the environment (Porter et al. 2014; Wheeler & von Braun 2013; Sunderland 2011; Wheeler & Kay 2011; Nelleman et al. 2009). Among these, climate change is increasingly being acknowledged to cause a drop in food availability due to changes in temperatures,

rainfall amounts and patterns, and increase in weather extremes that will significantly affect food production (Porter et al. 2014).

Notwithstanding the complexity of food availability concept and the difficulty to ensure it to a growing population, **food access** has even more composite underlying factors, thus being equally tough to ensure. As economies grow and diversify from food production and agriculture, access to food becomes increasingly important for achieving food security, thus calling for appropriate measures to be implemented. Increasing agricultural productivity surely improves access to food, both at the global and local scale, especially in light of the fact that domestic agriculture is still the main provider of food and the principal source of income and employment in rural areas (FAO, IFAD & WFP 2014). However, increasing productivity may not sufficiently address access related problems. The access to food, in fact, has also a complex connotation relative to social, economic and political aspects that has long been underestimated in food security related interventions. **Distribution**, in this sense, has a pivotal role in determining food access imbalances (Altieri 2014; Altieri & Nicholls 2012). From one side, the interruption of connections due to climate related issues like floods, or to security concerns, would prevent people from accessing food distribution hubs as markets or food aid points. In addition, distribution also has a social facet that has significant consequences in the access to food within the household (FAO 2014). In many contexts, in fact, grass-rooted intra-household social dynamics determine distribution patterns where male adults have the priority over women and children (FAO 2013b). This is clearly revealed in famine mortality statistics reporting that woman, children and the elderly, are the ones suffering the most and the first to die (FAO 2011).From the socioeconomic perspective, access strictly depends on economic resources of individuals, but also on social dynamics, both at country, regional and local level. In this regard, there is evidence that high food prices and the global financial crisis have reduced access to nutritious food and worsened nutritional status and health by reducing the quantity and quality of food consumed. The rise of food prices and increasing unemployment rates have, in fact, resulted in a reduced purchasing power, in turn leading to cutting down the amount of food consumed or shifting to cheaper foods high in fat and sugar. Both trends are strongly correlated with the spread of malnutrition worldwide (WB 2012; HLPE 2011).

Another important factor potentially affecting food availability and access is **food wastage** along the entire food chain, from production to consumption, as it is responsible for about one-third of global food production for human consumption not to reach the potential consumer (FAO 2014). Food availability and access have no significance if they are not associated with the third dimension of food security, *i.e.* **stability**, meaning the continuity over time of accessing nutritious food resources. Stability is here considered to strongly depend on the economic and political situation, meant as the status of the overall economy, people's ability to generate income and governments' capacity to support the poor. When ensured, these conditions favour food distribution and access, whereas, by contrast, disorders, market failures, economic crises, both at the regional and global level, significantly hamper these processes (Barrett 2013). In this regard, there is evidence that the economic

instability characterizing food and agricultural markets since the mid-2000s have determined large supply deficits, price swings and increased food security uncertainty (Gillson & Fouad 2015; FAO et al. 2011). Stability has also another component that is increasingly acknowledged as in important concern for the future: this is related to the ability of the environment to support food production. In light of the depletion and deterioration of environmental resources caused by the implementation of unsustainable production systems over the last decades, the production of food needs to be restructured in order to continue over time (Nelleman et al. 2009).

Availability, access and stability should be then considered in combination with **utilization** in order to effectively ensure food security: indeed, compromised utilization of food resources due to poor hygiene conditions and/or improper preparation practices can generate nutrition failures. Similarly, unbalanced diets can give rise to overweight and associated non-communicable diseases coexisting with micronutrient deficiencies. When focusing on utilization, the first issue to be considered is access to clean water and sanitation facilities. These factors affect the ability of safely utilizing food, as well as the health condition of individuals and, as a consequence, their nutritional status. Similarly, food quality and diversity do contribute to the determination of such a status. This is particularly true in low-income countries, but it generally applies to all high-risk vulnerable groups. In this regard, most progress has been made in regions that already have relatively high levels of overall food security, such as Eastern Asia and Latin America. By contrast, notable challenges remain in Southern Asia and Northern Africa, where problematic hygiene conditions and significant imbalances in dietary quality bring to high stunting prevalence among children. What is new with respect of the last century is that inadequate utilization of food resources is now giving rise to the coexistence of under- and overnutrition issues in countries undergoing rapid transformation, resulting in the so-called *double burden of malnutrition* (FAO, IFAD & WFP 2014).

How to ensure the four dimensions of food security – availability, access, utilization, stability - while preventing non-sustainable food production and consumption modes? Which room has the reduction of food wastage in improving food availability and access? To what extent can national and international agricultural policies act to improve food security?

As emerging from the abovereported considerations, food insecurity and malnutrition are deeply rooted phenomena caused by a complex set of factors strictly intertwined with another resulting in both immediate and underlying causes. The acknowledgment of such a complexity has made clear that, in order to tackle these worldwide problems, single actions taken by stakeholders operating independently are not sufficient in the short- or in the long- term. By contrast, it is the combination of a variety of actions taken by a similarly wide variety of actors to be indeed acknowledged to make the difference, as it emerges from the progress made towards the achievement of the MDG1. However, the challenge that actions taken at different

levels (local, regional, and global) by different stakeholders (private sector, governments and civil society) within different sectors may overlap, contrast or even compete with one another, does exist. Therefore, there is a strong need all the efforts be channelled and coordinated to make the best out of the implemented actions. Therefore, an important consideration emerges: it is not only what is done, but also in which context the action takes place. In light of this, the significance of an **environment conducive** to the implementation of tailored measures is indeed acknowledged as the key challenge for tackling hunger in the future (FAO, IFAD & WFP 2014; OECD 2013; FAO et al. 2011).

In this regard, the accomplishment of the conditions to ensure the effectiveness of measures addressing food insecurity and malnutrition entails structural changes of the actions taken at global and local level. These changes should first be based on a strengthened **coordination**. Coordination, first of all, should apply to the link existing between immediate hunger relief actions and long-term initiative supporting sustainable growth. The enhancement of such a link is not new, in that it constitutes the backbone of the well-established *twin track approach* by the United Nations. However, coordination should also be meant at a higher level meaning that it should also characterize actions by governments with respect to the design and implementation of mechanisms harmonizing food security and nutrition related policies in order to prevent fragmentation and inefficiency. In addition, also the **coordination and partnership** amongst different stakeholders operating in the field of food security and nutrition should be ensured (CFS 2014; FAO, IFAD & WFP 2014). **Social participation** is, in this sense, particularly relevant as it would ensure the involvement of a wide range of actors, including those that are more vulnerable and often marginalized. **Inclusion** is, thus, a key factor for the successful design and implementation of food security and nutrition programs and policies, especially in light of the increasing call for more equitable and just systems (CFS 2014; FAO, IFAD & WFP 2014; HLPE 2012). The widening of actors participating in the definition and development of food security initiatives also highlights the need for the clear designation of roles and responsibilities in order to effectively act in concert: hence, the **definition of ad hoc legal frameworks** would help to ensure that every entity involved, from governments to civil society associations, take up their own role (CFS, 2014; FAO, IFAD and WFP, 2014). However, evidence show that, in many cases, especially in politically fragile areas, key institutions may be delegitimized and processes dependent on them significantly compromised due to political and social unrest. This highlights the close link existing between the achievement of food security with the surrounding conditions and calls, once again, for the **adoption of an integrated approach** taking count of political and social aspects, to be addressed in combination with technical ones (Barrett 2013).

With specific regard to interventions focusing on technical aspects underlying food insecurity, a similar comprehensive perspective is widely acknowledged to be the key for effectively contributing to eradicating hunger. In this sense, in fact, a coherent approach is needed to promote and ensure complementarities among agriculture, environment, health, education and economic sectors in the implementation of food

security programs and projects. All of these sectors, in fact, differently contribute to address the immediate and/or underlying causes of food insecurity (FAO, IFAD & WFP 2014). Notwithstanding the need of adopting such an integrated approach, a special mention is here due to **agriculture**, given its relevance as a *game changer* while addressing food insecurity and hunger worldwide. Approximately 2.5 billion people, in fact, live directly from agricultural production systems, and growth in agriculture, more than in any other sector, is positively related with poverty reduction to which food insecurity is strictly associated (IFAD & UNEP 2013). Therefore, intervening in support of agriculture and rural development will be central to reduce the share of food insecure world's population. In this regard, the **raise of agricultural productivity**, to be complemented with mechanisms ensuring a **fair distribution of food resources**, would have to take place by implementing more environmentally and socially sustainable systems. The focus, by taking on the main issues hampering agricultural development worldwide, would now be on improving **land governance** to ensure **land tenure security**, especially in light of the pressure deriving from large scale land acquisition schemes mostly due to food and biofuel production (FAO, IFAD & WFP 2014). Also, increasing emphasis would be placed on **social and environmental safeguards** by putting in place appropriate social protection mechanisms, particularly for those small producers vulnerable to socio-political disorders and natural disasters (CFS 2014; HLPE 2012). Another important element calling for structural change would be the **attraction of investments in the agricultural sector** by encouraging inclusive business models that integrate small-scale farmers into high value food chain. **Strengthening value chains**, based on technical advancement and social inclusion, in combination with better connections with market, would significantly help farmers to raise their income, and reduce overall agricultural price volatility. This would be achieved through several actions taken at different levels including: improving physical infrastructure and ICT; strengthening producer organizations, business services, and value chain coordination; increasing access to finance; and facilitating intra-regional, South-South and global exchange. Along with agriculture related activities, the **development of non-farm activities** would also be important, as rural non-farm income may provide a significant contribution to food security (FAO, IFAD & WFP 2014; GHI 2013). Moreover, in a context of consolidated urbanization, the strengthening of rural-urban linkages would be a priority, as well as actions aimed at improving rural livelihood by launching services supporting productive activities and small businesses, especially when focused on vulnerable groups, as **youth** and **women**. With the latter still being widely subject to inequalities in access to markets, resources, credits and income, the **gender gap** still requires mainstreaming in all agricultural project and programs (FAO 2011). In light of the increased frequency and magnitude of extreme weather events, the **reduction of vulnerability to environmental disasters** and the adoption of appropriate measures to enhance risk management are to become more and more crucial, calling for actions to reduce the risk of outbreaks, as well as of losses of products and assets. The same applies to socio-political disorders, often giving rise to humanitarian emergencies (Lipper et al. 2014; Porter et al. 2014).

Not least, given the extent of food wastage worldwide - recent estimates report that the share of food supply lost every year through food loss and waste could be enough for feeding 3 billion people (Stuart 2009) -, its reduction is crucial for achieving food security, with *ad hoc* measures to **address food loss and waste.** In regard to the former, as the lack of infrastructures and poor harvesting/growing techniques are among the major elements in generating food losses in developing countries, the transfer of existing technologies and the dissemination of good practices, along with market-led investments, would likely have positive impacts. On the other hand, in developed countries, where food waste is the main issue, promotion of a shift in the consumer behaviour, changes in legislation and business models towards more sustainable food production and consumption patterns would be highly recommended (Parfitt et al. 2010).

1.2 Safe and nutritious food for all

Food safety has to be considered the prerequisite to ensure a healthy nutritional status. Indeed, balanced and nutritious food protects individuals from malnutrition, but this has no meaning if food itself is not safe, thus being associated with food borne diseases. Today, the food chain has become longer, more complex and globalized, allowing international trade of a huge amount of food products (Käferstein, Motarjemi & Bettcher 1997). Moreover, a longer food chain complicates foodborne disease outbreak investigation and product recall in case of emergency.

Among the determinants of food safety in food production processes fundamental are **fertilizing systems**, **pesticide** (WHO 2015) and **antibiotic applications**, and **food hygiene procedures**; on the other hand, similarly crucial is the application of biotechnology for monitoring both processes and **major hazards** - which include allergens, microphysical particles, insects, pathogenic bacteria, viruses and toxins (Borchers, et al. 2010; WHO,2012b). Antimicrobial resistance is a growing global health concern (WHO 2014) as overuse and misuse of antimicrobial agents in agriculture and animal farming is one of the factors leading to the emergence and spread of antimicrobial resistance. In regard to food borne diseases, they do occur in all countries, with no significant differences related to income; however, the significances of an outbreak are extremely different especially for infants, pregnant women, the sick and the elderly, for whom the consequences of foodborne disease are usually more severe and may be fatal. In high-income countries, in fact, epidemics generally have mild spread, whereas in low-income countries there are still high levels of mortality associated with food safety related diseases, with infant diarrhoea, cholera and typhoid fever still playing a major role. In developing countries, the guarantee of food safety often fails due to the lack of conventional technologies for food conservation, such as preservation by cold storage techniques, adequate packaging and processing, with the latter being related to efficient thermal treatments, for example.

Globally an estimated 2.2 million people die from food- and waterborne diarrhoeal diseases per year, 1.9 million of whom are children (WHO 2008). Furthermore, in industrialized countries, nearly one in three persons per year suffers from a foodborne

illness (WHO 2008). As mentioned, food safety is an essential component of the concept of nutrition. This, in turn, is a broad concept deriving from the interaction of factors including consumption pattern and lifestyle, whose imbalances lead to malnutrition status. In this regard, by **malnutrition** it is meant a status in which a deficiency, excess, or imbalance of energy, protein, and/or other nutrients, causes measurable adverse effects on tissue/body form (body shape, size and composition) and function, and clinical outcome (Elia 2000). Unquestionably, the burden of malnutrition is multifaceted with coexistence of undernutrition, micronutrient deficiencies, overweight exemplified by obesity, non-communicable and chronic diseases. In 2012-2014, 162 million children under the age of five -one in four- in developing countries were undersized due to **chronic undernutrition** and 51 million suffer from **acute undernutrition** (IFPRI 2014). In the same reference period, 805 million people were estimated to be chronically undernourished; at the same time, **micronutrient malnutrition**, often referred to as hidden hunger, affects around 2 billion people (over 30% of the world population) with serious public health consequences (FAO 2014). On the other hand, 42 million children under 5 years are **overweight** or **obese**, 1.9 billion adults are overweight, of these over 600 million are obese (WHO 2015). This figure is increasing in low- and middle-income countries. It is noteworthy that there is no longer a clear distribution of these phenomena between "north" and "south" of the planet or amongst higher- or lower-income countries. Nowadays, overweight coexists with undernutrition in many countries, even where undernutrition share is still relevant (Popkin et al. 1998; Popkin et al. 2002; Popkin et al. 2012).

The most remarkable fact about malnutrition has been pointed out in the analysis of death and disabilities - Global Burned of diseases – reporting that the incidence of diseases linked to overnutrition is higher than the one connected to undernutrition. The risk of coronary heart disease, stroke and type 2 diabetes, in fact, grows steadily with increasing body mass, as do the risks of cancers of the breast, colon, prostate and others. Chronic overweight also contributes to osteoarthritis—a major cause of disability in later life (Lim et al., 2012). There are conspicuous direct **socio-economic effects** of health issues related to overweight at the global level mainly related to medical expenses of the associated pathologies and affecting individuals, their families and the whole society (Lehnert et al. 2013). Moreover, **indirect costs**, largely based on productivity losses due to illness, disability and early mortality, are affecting human capital development and productivity (Lehnert et al. 2013). This rising epidemic reflects **changes** occurring in societies, as well as in the **behavioural patterns** of communities with relevant differences related to gender and age. Several factors act on overweight occurrence at global and local level; in turn, these variables are interconnected one to the other. One of the most relevant determinants, characterized by a domino effect, is the shift in global dietary patterns in terms of food sources, modes of food processing and food distribution, which have led over the past decades to the predominance of highly processed foods and drinks. In particular, the**nutrition transition** implies the replacement of traditional food such as whole grain cereals, roots and tubers with the use of vegetable oils mainly derived from palm, soybean, corn, cottonseed and rapeseed oil, animal products and sugar (Popkin 2001). The transition affects not only industrialised but also emerging countries, like Brazil,

Russia, India, China and South Africa (Monteiro et al. 1995; Doak et al. 2000; Kruger et al. 2005). Moreover, the shifts entail the preparation of food, which has changed passing from baking, steaming and boiling to fried preparations (Popkin 2012). The effect is a high-energy-rich-in-fat diet that, combined with reduced physical activity, contributes to overconsumption of calories and micronutrient deficiency (WHO 2003).

In this framework, the **physical and economic access** to healthy food is a factor having a high impact on the spread of malnutrition, especially in low-income countries but, in general, in all high-risk vulnerable groups. Currently, sweet and high-fat foods provide dietary energy at the lowest cost; therefore, consumers with limited resources select those products as an effective way to save money. This access related dynamic is also related to the process of **urbanisation** that causes people to abandon their no longer competitive domestic production systems in favour to systems the integration of nutrition and agriculture is getting weaker (Mendez & Popkin 2004).

Apart from being hardly compromised by overweight and its coexistence with micronutrients deficiency, the nutritional status of the world's population is highly marked by chronic undernourishment, which remains high in absolute terms, mostly hitting women and children. Nevertheless, the MDG1c hunger target – related to halve, by 2015, the proportion of undernourished people in the developing world – is within reached, but considerable efforts are immediately needed, particularly in countries where progress has stalled. Despite overall progress, large differences remain across developing regions and amongst vulnerable groups of population. Particularly relevant is the stunting and wasting incidence in the first 1000 days after conception, being accurate predictor of foregone individual and societal potential in current and future generations. Indeed, **undernutrition in the first 1000 days of a child's life** can have lifelong and largely irreversible impacts as it impairs physical and mental development, increases the risk of chronic diseases and premature death in adulthood, and negatively affects the lifelong ability to learn, be economically productive, earn income and sustain livelihoods (Black et al. 2013). The phenomenon is linked with maternal malnutrition, including anaemia, and brings to poor foetal development and low birth weight. This, in turn, is associated to acute and chronic malnutrition and, later in life, to higher risk of overweight and non-communicable diseases. At a later stage, the low rate of exclusive breastfeeding and the poor quality of complementary feeding (low vitamin and mineral, high sugar and fat) are also a determinant of child malnutrition (Black et al. 2013).

How to ensure an environmentally sustainable and culturally acceptable diet based on the consumption of safe and nutritious food for all? What is the role of nutritional education for promoting the adoption of diet and lifestyle adequate for preventing and recovering from diseases associated with dietary imbalances?

Food contamination has far-reaching effects beyond direct public health consequences – it undermines food exports, livelihoods of food handlers and economic

development, both in developed and developing countries. Recent trends in global food production, processing, distribution, and preparation are creating a growing demand by consumers for effective, coordinated, and proactive national food safety systems. However, achieving food safety is a multi-sectoral effort requiring expertise from a range of different disciplines – toxicology, microbiology, parasitology, nutrition, health economics, and human and veterinary medicine. **Scientific and technological progress** has improved different aspects of food safety: innovation in technology, in fact, now allows for safer production and transformation processes and has improved the detection of risk agents (Floros 2010). Furthermore, **novelty in energy and water use** opens opportunities in medium- and low-income countries to adapt technology to prevent food contamination. **Information technology** plays an important role in revolutionizing health education, data exchange, and the training of professionals (Käferstein & Abdussalam 1999). **Market** also plays a major role in ensuring food safety by providing information for consumption practices about adequate food storage and preparation (Redmond & Griffith 2003). In high-income countries, this last step in the food chain is relevant for food borne diseases, whereas in low- and medium- income countries the main issue is the availability of adequate safe water along the whole food chain. Local communities, women's groups and **school education** also play an important role. Raising awareness, **simplifying rules**, **improving skills and infrastructures**, adapting food safety monitoring to local conditions, helping in formulating management systems, would **harmonize legislation** about food safety would significantly support medium and low-income countries to improve food safety conditions by raising standards, thus facilitating food products exchange and contributing, from the basis, to healthy nutritional status worldwide (FAO/WHO 2003). It should be considered that behind undernutrition status there is a complex framework shaped by poverty, food scarcity, limited economical and physical access to goods, economic and political instability, and weaknesses in education and health systems.

At present, most of the actions implemented against malnutrition are "nutrition specific", meaning that they are designed as population-level initiatives to prevent overweight/obesity and to address the immediate causes of undernutrition by highly cost-effectiveness interventions (Hoddinott & Bassett 2009). Significant less attention has been addressed to "**nutrition sensitive**" strategies by providing integrated measures for addressing malnutrition (Ruel et al. 2013). When focusing on undernutrition, this type of interventions should be based on the design and implementation of approaches dealing with distal causes of undernutrition, thus intervening on food security, health care, water and sanitation and socioeconomic services (UNS - Standing Committee on Nutrition 2013). Concerning overnutrition, particular attention should be given to the identification and implementation of a set of obesity prevention strategies and measures that local governments and communities should refer to when planning, implementing, and monitoring initiatives to prevent overweight and obesity (WHO 2012; WHO 2014b). In the framework depicted above, it is crucial to promote farmers and other professionals working in agriculture to include nutrition in their objectives. In this sense, an important role has country level programming in **nutrition-sensitive agriculture and food system**. With regard to

this, three main themes can be identified, namely resilience building, women's empowerment and improving nutrition knowledge and practices. **Resilience building** is essential to reinforce local food systems and to shift local feeding practices through livelihood strengthening activities and social safety nets, particularly addressing vulnerable groups. **Empowering women** is considered fundamental for increasing nutrition sensitivity in agriculture as they make up a large percentage of the agricultural labour force –especially in developing countries. In addition, their control on the household's economic resources and income flows has been found to have positive impacts on nutrition security. Integrating **nutrition education** into agricultural and food system interventions is another essential aspect to ensure in order to promote the social and behavioural change necessary for improved nutrition practices (UNS - Standing Committee on Nutrition 2014; UNS - Standing Committee on Nutrition 2014b).

Another aspect to be considered to frame interventions tackling malnutrition is **early prevention**. Lack in this regard is mostly related to the situation of women and children's nutrition. In order to spread a positive behaviour, education actions should involve the use of the mass media, pricing policy, consumer friendly food labels, widespread educational activity in the community, workplaces and schools, and other legislative and fiscal measures. Education programs should be particularly focused on the promotion of breastfeeding in the first 6 months of child life, the reduction of salt consumption, the removal of trans-fatty acids and the limitation of saturated fatty acid and sugars. By contrast, there is a profusion of "anti-education", particularly addressed to children. In recent years, all over the world, the behaviour of the consumers has remarkably been influenced by marketing and advertisement actions carried out by food industries. Global marketing and the systematic shaping of taste by giant corporations played a relevant role in the globalised food industry, as well as in the connected behaviour of the consumers. Relevant effect has to be attributed to unhealthy food particularly designed for children, redundancy of energy dense foods and high-calorie non-alcoholic beverage. Virtuous cases where a greater awareness on the risk associated with unbalanced diets are leading to a shift in food consumption habits do exist. This is the case of Nordic Countries as Finland, Denmark and Norway, that have changed, through **public health intervention programs**, the high-fat, energy-dense diets consumed by their populations (Groth et al. 2014; Uglem et al. 2013; Jonsdottir et al. 2013; Lyytikäinen 2013). They have significantly reduced serum cholesterol levels and a number of deaths from coronary heart diseases. Similarly, Singapore has decreased the levels of some cardiovascular risk factors and childhood obesity by means of a national intervention programme (Gupta et al. 2012). Specific strategies of education should be addressed to programs that connect students to farmers and increase awareness of local food systems, the environment and economic benefits to the community and awareness regarding food waste impact at household level (Klimis-Zacas 2014).

Finally yet importantly, the impulse of consumption of foods related to **traditional diets** may have a positive effect on the prevention of malnutrition in the population, bringing back the population to a balance dietary intake and re-establishing a strong

synergy with the environment (Trichopoulou, Soukara & Vasilopoulou 2007; Trichopoulou 2012; Vasilopoulou, Dilis & Trichopoulou 2013). Significant is the action by the Food and Agriculture Organization (FAO) promoting sustainable diets, which contribute to food and nutrition security and to healthy life for present and future generations. Ideally, sustainable diets are protective and respectful of biodiversity. Moreover, they are culturally acceptable, economically accessible, and nutritionally adequate, safe and healthy. Traditional diets may be considered sustainable diets as they have a positive effect on the prevention of population health and a strong synergy with the environment. As most traditional foods are plant-based and integrated with the local biosystem and economy, they are almost by definition environmentally friendly, or at least minimally disturbing. Nutrition globalization does need to continue, but it is important to preserve diversity and collective identity. In this sense, UNESCO sowed the seed of change by inscribing the Mediterranean diet on the Lists of Intangible Cultural Heritage in 2010. From this acknowledgment, a variety of programs, such as European Union EURRECA project, developed a multi-faceted framework for the systematic investigation of traditional food symbolised in the Mediterranean diet – considering their nutritional values, their role in promoting a healthy status and their environmental impact (Pijls, Ashwell & Lambert 2009).

As a conclusion, there is evidence that, in order to advance in achieving nutrition security worldwide by tackling the main issues affecting world's population, positive changes must come from all parts of society: governments and institutions, the third sector including both businesses and non-profit organizations, and the civil society. All these actors, in order to take affective actions, should act in concert based on a fine tuned coordination.

1.3 The way to future food production

Since the beginning of the 1960s to date world population has grown from three billion to more than seven billion (UNESA 2014), thus imposing an increasing food demand to which agricultural production had to keep pace with. The achievement of high production levels has come along with a substantial **intensification of production processes** that has been largely driven by research, development and technology transfer initiatives that together accounted for the so-called *Green Revolution* (Hazell & Wood 2008). At its inception, the Green Revolution was launched and promoted under the assumption that environmental resources as land, water, energy, and biodiversity would always been available. Evidence is now demonstrating that this is not the case, as alarming data point to an irreversible depletion of natural resources, with significant health and environmental implications (Altieri & Nicholls 2012). Among these, the **reduction of biodiversity** is particularly significant and explicative. Agricultural production is, in fact, strongly based and dependent on biological diversity. Historically about 7,000 plant species have been cultivated and collected for food since agriculture began about 12,000 years ago. Nowadays, only about 30 plant species supply 95% of the global demand for food; over 75% of genetic diversity has been lost in the nineteenth century due to the selection and adoption of high yielding varieties (FAO 2010). What is more, the use of highly selected genetically

homogenous varieties, often applied in monocultures now covering the 80% of the 1,500 million hectares of global arable land (Altieri & Nicholls 2008), makes modern agricultural systems more vulnerable to climate related shocks that, in the form of extreme events, are becoming more frequent and violent.

Apart from being potentially hardly hit by **climate change**, agriculture itself is a major driver of this phenomenon, as it is an important contributor to global emissions of greenhouse gases (GHG): according to the latest figures from the Consultative Group on International Agricultural Research (CGIAR), the global food system, from fertilizer manufacture to food storage and packaging, is responsible for up to one third of all human-caused greenhouse gas emissions (Gilbert 2012). In this framework, agriculture has a major role especially concerning methane (CH4) and nitrous oxide (N2O), whose emissions have constantly increased by nearly 17% from 1990 to 2005 (Smith et al. 2007).

Another agriculture related factor directly affecting GHG emissions is **land use and land-use change**. The conversion to agricultural land, which has largely occurred in certain areas like South America and South East Asia, is associated with clear changes in land cover and carbon stocks. Carbon stocks locked in aboveground biomass, in fact, are usually removed as products, released in the form of CO2 by combustion, or decay back to the atmosphere through microbial decomposition. There is evidence that land use practices and land use changes have played a role in changing the global carbon cycle and, possibly, the global climate: since 1850, in fact, roughly 35% of anthropogenic CO2 emissions resulted directly from land use (Smith et al. 2007; Foley et al. 2005).

Agriculture related land use change has had – and still has - deep consequences also on **freshwater resources**. Land use, in fact, can disrupt water balance and alter the partitioning of precipitation into evapotranspiration, runoff, and groundwater flow. What is more, water demand associated with land-use practices, like irrigation, directly affect freshwater supply through water withdrawal and diversion. In this sense, agriculture is a significant driving pressure on water availability, given that it accounts for more than 70% of total consumptive use (WWAP 2014; FAO 2012). Agriculture, especially when intensively managed, has also an important impact on water quality as it increases erosion and sediment load, and leaches nutrients and chemicals to groundwater, streams, and rivers. The intensification of agricultural practices, often deemed essential for feeding a growing population reaching 9 billion people by 2015, will likely further worsen both the depletion and the deterioration of water resources, as well as will climate change, which is expected to reduce water availability (WWAP 2014). Also, the differentiation of water use, resulting in an increase in the demand for water for domestic and industrial purposes, is to be expected. Therefore, both the absolute increase in water demand and the different purposes it will be used for will likely generate conflicts, especially in socio-political fragile areas (Gleick & Heberger 2014).

Along with water, land is a resource that is increasingly subject to a strong competition. Though the rush to land by acquisition or long-term lease is far from

being an unprecedented trend, it is now putting increasing pressure on countries where large extensions of land are still available. This phenomenon, a.k.a. **land grabbing**, mostly occurring in emerging countries, poses significant concerns in ensuring the access to resources essential for producing food, thus threatening food sovereignty and food security for large share of world's population. Food production has long been a major driver of large scale land acquisitions (De Schutter 2011), but it has been more recently overshadowed by another factor also contributing to the commodification of land: though still strongly debated, in fact, the production of **biofuel** is largely considered to have significantly boosted land acquisition deals especially - but not only - in African countries (Schoneveld 2011; Cotula et al. 2009). In this regard, though the biofuels boom appears to have peaked in 2007-2008, the discourse on the effects of competition between agriculture for food and biofuels production dates back to the 1970s.

The current and future demand for biofuels, hereby intended as liquid transport fuels derived from biomass resources, varies significantly between countries and regions. Drivers for demand include the economic, energy security and climate change policies of national governments; business opportunities in the energy and agricultural sectors; technological innovation and, not least, social and environmental concerns. The latter, in particular, are mostly related to the so-called 1st generation biofuels that are based on the utilization of specific agricultural commodities – mostly grains and oilseeds – processed through well-established sugar fermentations or oil processing techniques. The application of tax incentives and/or subsidies to energy crops (*i.e.* sugar cane, corn) in order to meet government mandated targets for substitution of fossil fuels has had major implications on land use dynamics, with energy crops gradually replacing food crops on large extensions. This trend is likely resulting in long-term effects, such as changes in land and commodity prices, as well as in farmers' expectations on the price trends of crops (Sims et al. 2007). The strong link between **food production and energy** clearly emerges also from the share that the food sector has out of the world's total energy consumption, being about 30%. In this regard, the direct energy demand of primary production is limited to less than 2% of total end-use energy consumption, while more than 70% of that energy is used beyond the farm gate in distribution, processing, storage and preparation processes (FAO 2011). When analyzing the energy-agriculture nexus, developing and developed countries experience different energy related issues: in developing countries, in fact, there still is a widespread problem of limited access to modern energy services that significantly hampers local development. In developed countries, increasing attention is being paid to renewable energy; however, the high share of agricultural production aimed at bioenergy feeds the tense debate about the impact that bioenergy has on food security, especially in the form of biofuel and biogas that are proven to actually offset only a modest share of fossil energy use over the next decade.

Another topic currently under the spotlight as likely affecting the environmental sustainability of food production is **food wastage** along the agri-food chain, whose magnitude has been recently quantified as one-third of global food production for human consumption. This phenomenon has an economic cost of about 1 trillion USD

each year (FAO 2014). Such loss causes market inadequacies and has negative environmental effects because of inefficient land and water use. Moreover, apart from mere economic assessment, it should be borne in mind that food wastage also has major social implications. While analyzing food wastage by a global perspective, there are relevant differences between countries: in medium- and high-income countries, in fact, food is mainly wasted, meaning that it is thrown away at the end of the food chain, even when still suitable for human consumption, with Europe wasting 89 million tons of products overall, or 179 kg per capita, per year (FAO 2014). On the other hand, in developing countries, there are significant post-harvest losses in the early stages of the supply chain, mostly due to structural limitations in harvest techniques, as well as in storage and transport infrastructures, combined with climatic conditions favouring food spoilage (FAO 2013a).

In light of the issues related to food production that are here presented in the form of a bird's eye view far from being exhaustive, **technology** has a pivotal role in agriculture with respect to the dual need of producing more while preserving environmental resources. Indeed, it can contribute to close the yield gap, even though its relevance in agriculture should be extended beyond the production phase to the entire supply chain, including transformation and distribution processes. A key –often underestimated- issue regarding technologies is the access to them, as well as to the information associated with their implementation and use. Apart from the geographic remoteness of certain areas, it is social and economic dynamics often preventing the spread of technologies. In developing contexts smallholder farmers are often bypassed by technological progress and, amongst them, women are more likely to be at a disadvantage, even though they highly contribute to global agricultural production (up to 80%) (FAO, IFAD & ILO 2010). The role of technology in development is extremely complex as, while being aimed at supporting social and technical advance, it could actually amplify and exacerbate inequalities embedded in societies (Toyama 2011).

When discussing about technology in agriculture a specific focus is necessarily due to **biotechnology.** The advent of the so-called modern biotechnologies came in the 70s with the application of gene transfer through recombinant DNA techniques. Soon after, the potentials of the new technologies was tested in agriculture, with the first vegetal **genetically modified organism (GMO)** being released in the early 80s. Since then, GM crops have significantly gained ground: in 2013 they cover over 175 million hectares in 29 countries around the world (ISAAA 2013). Maize, canola, soy and cotton account for almost all GM crops grown worldwide. GMOs have been long dividing public opinion, institutions and research entities. GMOs are, in fact, often presented as a significant advancement over the traditional breeding methods as they allow an aimed and more rapid genetic improvement process by selecting, isolating and transferring a specific DNA sequence (Tonelli 2014). By contrast, there are several concerns preventing GMO from being widely accepted. Amongst them: the introduction of a transgene into a recipient organism and the risk of the occurrence of such a gene transfer into non-target plants; the establishment of agroecosystems highly vulnerable to climate induced changes in place of biodiverse resilient agroecosystems; the control of research and commercialization of GM crops by few

multinational companies compromising the food sovereignty of local communities; possible health risks for populations exposed to a diet containing GM products (DeFrancesco 2013; Holt-Giménez & Altieri 2013; Philips 2008). Given the articulated framework built around GMOs, absolute conclusions should be far from being drawn. Instead, there is a broad based consensus within the scientific community that GM crops should not be considered nor judged as a whole, but rather thoroughly analyzed and valued on a case-by-case basis (Tonelli 2014; Whitty et al. 2013).

In the complex framework depicted with respect to the agrifood sector, it should be borne in mind that, notwithstanding the advancement in crop yield obtained during the twentieth century, there are still 805 million hungry people that currently do not have food, sufficient and nutritious, ensured (FAO, IFAD & WFP 2014). Therefore, there is a strong need to think and develop a new paradigm for agriculture that go beyond the efficiency/sufficiency dilemma, while rediscussing and questioning the productivist approach that has characterized the agricultural sector over the last century. Central to such a debate is the acknowledgment that world food production should not only be aimed to food availability, but also to its fair distribution in order to guarantee access to sufficient and nutritious food to all.

How can agricultural production keep pace with a growing world population by preserving natural resources, as land, water, energy and biodiversity, while minimizing the negative side effects deriving from production and consumption processes? Is the model of **'sustainable intensification agriculture**' *possible for feeding the world in the future?*

Agricultural systems that are sustainable, biodiverse, resilient and socially equitable do exist and may represent a valid alternative to the present situation. A promising approach receiving much attention worldwide over the last decades in the framework of climate change, economic and energy crisis is the one based on **agroecology** that draws on ecological concepts for designing and managing sustainable agroecosystems by favouring and benefitting from natural processes to replace external inputs. As such, it is knowledge-intensive, rather input-intensive, and strongly based on local knowledge derived from the integration of people with their own land (Gliessman 1998; Altieri 1995). Agroecology is aimed at the achievement of food sovereignty. In addition, agroecological production is mostly drawn on and well suited for the ecologically based agricultural systems developed by smallholders, family farmers and indigenous people that, together, account for about the 50% of the global agricultural output for domestic consumption. Among them, a special mention deserves women, whose contribution to agriculture production is often undercaptured by official statistics (Altieri & Nicholls 2012). By applying agroecological principles, farmers would reduce their dependence on external input and experience higher and more stable yields. An assessment of agricultural projects based on agroecology principles evidenced increases in food production over 29 million hectares, with over 9 million farmers benefitting from it in Africa, Asia and Latin America, with the latter being the

background of an "agroecological revolution" involving deeply rooted social movements (e.g. Via Campesina) (Altieri & Toledo 2011).

Notwithstanding the increasing evidence of agroecology as the pathway for improving agricultural production, still the dissemination of such a model, particularly in developed countries, encounters significant resistance. This is mostly due to driving market forces, pushing towards mass economy production, and shrinking financial resources across the public sector. Moreover, there is a wide perception that agroecological practices are themselves not sufficient to achieve and sustain resilient food production (Altieri & Nicholls 2012). However, their value should be framed in the structural transformation they point to, based on the reorientation of food value chains towards increased efficiency and fair access to food. In this sense, agroecology should be considered as a part of a new social and economic order towards the establishment of more sustainable food production and consumption systems.

Similarly to agriculture, water management could indeed be the lever for development, especially in those areas that are expected to most significantly experience population growth and climate change effects, in turn likely increasing water scarcity and, thus, conflicts over water resources. As water scarcity is widely recognized to be mostly due to a mismanagement of water, the real advancement in this sense is the acknowledgment of the link between the hydrogeological, technological, institutional and sociopolitical factors underlying it. Such a new integrated approach is being established worldwide in the plethora of practices based on participation, governance and capacity building that is implemented in the framework of *ad hoc* policies where technical and policy aspects are intertwined with one another (Ghiglieri et al. 2014). Several noteworthy experiences have been realized, with particularly positive results in those areas historically characterized by significant water scarcity related issues and long lasting conflicts over water resource. This is, for example, the case of the Middle East and Northern Africa (MENA) region, where interstate cooperation in both research and practice between different institutions and stakeholders has pointed to water management as a tool for mediating and strengthening international relations. This feature, which is well captured by the term hydrodiplomacy, assumes a significant relevance in an area often wrecked by rooted territorial disputes (Comair 2009).

The application of technology to water management has indeed a great potential for achieving higher water use efficiency, and so does it in the advancement towards the development of alternative energy sources. In order to overcome the issues arising from the production of biofuel, in fact, alternative solutions (*i.e.* cultivation of energy crops on marginal lands, use of agricultural products/by-products to produce pellet fuel) and new technologies are emerging and look promising. In this regards, there is plenty of examples that can be mentioned to prove how research and practice, though in some cases still in the pilot stage, are now significantly advancing towards clean energy technology. Amongst them, there are 2nd and 3rd generation biofuels including advanced lignocellulosic biofuel, biogas from agrifood industry and urban solid waste, crop residues, agricultural co-products, and algae technologies. Also, the introduction

of technologies well established in developed countries in emerging contexts (*e.g.* solar collectors) is to be considered as a real leap forward, as it ensures the access to energy to an increasing share of world population (Riva 2014).

Innovation is already playing a major role in reshaping the agrifood sector worldwide by providing tailored solutions to implement more environmentally sustainable and socially just production systems. These solutions range from the implementation of high tech systems for optimizing irrigation and fertilization processes, controlling food quality and monitoring transformation processes, to the application of mobile technology for facilitating information sharing and knowledge transfer, just to mention few. Biotechnology, on the other hand, has long unveiled its potential in supporting the selection and adoption of both plant and animal species more resistant to biotic and abiotic stresses, but the challenge in providing varieties better adapted to harsher climatic conditions is getting more urgent in light of the expected changes in the distribution of rains, temperature increase and extreme events. Notwithstanding the relevance of biotechnology in pursuing genetic improvement, an important concern is the acceptance by consumers that have gradually matured an unprecedented awareness on what they eat. In this regard, not only the evidence of safe dissemination and consumption of products is strictly required, but also the assurance that the entire food value chain is set according to socially fair and environmentally sound conditions is increasingly acknowledged as a factor determining an informed choice. In this regard, the major role of consumers in shaping future food supply is emerging in the form of trends based on the direct interaction with and between consumers (*prosumerism*); among these, there are the commoditization of public goods, revitalization of the commons and the transition (town) movement. In particular, the transition (town) highlights that the urban dimension of food production is also increasingly valued, though yet the majority of town, cities and even metropolises own no specific food policy or plan. Cities like New York, Toronto, London, Amsterdam and Berlin are exceptional in this sense as they provide the first attempts to develop a specific food strategy and/or plans (Zasada 2014).

Consumers are also central to several awareness raising, information and education initiatives aimed to reduce food waste in the framework of national, regional and local level measures in the European context. Such measures are combined with research and innovation, policies, awards, self-imposed certification, food redistribution operations. Italy is contributing with virtuous initiatives such as the Last Minute Market and the Bologna Charter, first European document Against Food Waste. Actions limiting food losses are framed in an articulated range of solutions, given the complexity behind food loss. Relevant good practices have been implemented in both crop and animal production by optimizing storage and conservation solutions and improving transport, processing and packaging (Segrè 2014).

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[1] It is here referred to target 1c of the MDG1, *i.e.* Halve, between 1990 and 2015, the proportion of people who suffer from hunger. http://www.un.org/millenniumgoals/poverty.shtml

2. Food Cultures Practices of Sharing and Exclusion

From the anthropological point of view, nutrition is one of the crucial dimensions through which mankind communicates collective attitudes and forms of social organization. As a science of humankind and cultures, anthropology has also explored food cultural diversity through the different ways societies eat, showing how the universal necessity of nourishment turns into a contextual practice, shaped by specific human practices: codes, values and nutritional patterns. Food is transformed from *nature* into *culture* by means of knowledge and beliefs (food manipulation, ways of sharing resources and cooking, styles of production/consumption, meal organization and incorporation rules). This process allows humans to transform a resource into something 'familiar' or, in other words, edible. Nutrition is a system of communication, which brings together meanings, imaginaries and identitarian attributes. This is mainly due to the fact that food is intrinsically an inanimate substance that only becomes relevant when it starts to have a social and contextual sense; that is to say, when it activates relationships, transactions, exchanges, reciprocity and alliances. In all of these cases, economic, political and symbolic aspects always co-exist. Today, the actual massive flow of people, commodities and imaginaries at the global level, has made the relationship with food an even more crucial element for the individual and collective experience of contemporaneity. The food carries the warmth and intimacy of familiar relations, exemplifies the transmission of culinary knowledges that have been incorporated by individual skills and brings back to the sensorial education that has become, since childhood, a specific way of interacting with the outside world. Especially in migratory contexts, *what* one eats as well as the practices of conviviality become important in order to sustain the sense of belongings in relation to an imagined community (Anderson, 1991). From the anthropological point of view, the growing interest for the "authenticity" (also in the culinary domain) can be considered a collective answer to a shared feeling of dismay in the face of the anonymous Capital invasion. In fact, the commodification of food and the globalization of its practices of production, circulation and consumption have not only meant its standardization, syncretism or cultural delocalisation. Rather, the reinvention of tipicity's markers that make food a product-symbol of a local culture can also be considered an answer to the globalization of food consumption's practices. The reconstruction of a traditional culinary culture as an exclusive, immutable and ancestral tie between a community and a territory has emerged when the people's sense of belonging to a single place became problematic.

Indeed, the anthropological perspective on food practices in the contemporary world has covered a much wider and complex discourse about the collective imaginary and memory, the self representations and the relation to the "culinary other", the institutionalization of food as a cultural heritage and the social critiques that picked up on this process of heritagization. The three paths of research that we propose as anthropological reflections on food practices make clear the multisided and

continuously changing characters of food as complex cultural phenomena. The first topic, on *Food Aesthetics and Culture of the Senses* highlights how taste and disgust trace borders and frontiers, impose exclusions and hierarchies, as well as they define belongings and collective identities. The direction of research on *Food and Identity* has focused on one side on the cultural effects that follow the agricultural capitalisation and commodification of land, such as separating agriculture from ecology, production from consumption and reproduction, and the increasing de-symbolisation of agricultural land (Vasavi, 2015); on the other side, food patterns of consumption are studied as tools of identity construction at the individual level (diet regimes, consumption of organic or industrial food) and at the collective level (alternative patterns of consumption), which are related firstly to the dimension of incorporation that ties intimately the food and the body. The last topic of research titled *Food Heritage,* focus mainly on the cultural transmission and political process of institutionalisation of food practices as a collective heritage.

2.1 Food aesthetics and culture of the senses

Likes and dislikes of food are social constructions shaped through the cultural elaboration of the sensorial experience (Elias, 1969; Macbeth, 1991; Howes, 1991; 2003 Anderson, 2005). Their transmission from one generation to the other leads to the awareness of who we are and the memory of what we have been (Sutton, 2001; 2010; Holtzman, 2006): by mean of them, identities and belongings are defined. Likes and dislikes are incorporated forms of personal and collective memory that are often marked by tears and lacks, by violence, diasporas and famine (Stoller, 1995). Indeed the issue of taste is a political one, with clear economical implications (Bayart, 1989; Appadurai, 1981): the taste is a form of social action through which societies discriminate between friends, enemies and guests, building ethnic, class and gender differences (Bourdieu, 1979). Tastes, food preferences and aversions, are characterized by changes, sometimes slow sometimes fast, ephemeral or lasting. Today, due to the establishment of the agri-food industry on a global scale, there is the spreading of standardized products that lead to a sort of taste simplification, to a planning of the sensorial experience for economic ends, and to a deeper social conditioning. This is achieved through multisensory marketing strategies, through the production of ready-made food with high level of sweeteners, fat and salt and through the creation of engineered synthetic flavors and food shapes (Roberts, 2008; Moss, 2013). It is a phenomenon experienced both in the South and in the North, in the rich countries as well as in the poorer ones and that is particularly significant in the economically and culturally disadvantaged social strata, who are the main junk food consumers. At the same time a quite elitist search for culturally rooted tastes has grown, tastes which have often in fact been lost in the past, that have to be recovered or re-invented by means of procedural guidelines or certifications. In this way the values of "authenticity" and genuineness have to deal also with culture, linking food, memory and territory.

All these processes of taste and consumption reconfiguration have to be thought in the framework of the wider aestheticization process of daily life that covers all the

spheres of social life (Featherstone, 1990; Rifkin, 1995; Lipovetsky, Serroy, 2013): leisure and entertainment, beauty and sensorial gratification become objects of mass consumption. The process of aestheticization becomes particularly evident in the connections between food, arts, design and fashion. Increasingly, the differentiation among similar food products takes place through their aesthetic reworking, by packaging, advertising, brands, logos, and "signed" food. The food appearance, the visual dimension of food experience, becomes the most relevant aspect for the consumption patterns, especially when the urge to eat goes along with the equally powerful one of fasting in order "to stay in shape". The danger is that much of our food experience comes down to a play of appearances.

Is it possible to address some policy recommendations to the bottom-up policy-makers body, economical and social ones, fulfilling commitments in the different domain of food production, distribution and consumption, policy recommendations that allow, in a non-prescriptive way, to strengthen the connection between taste and culture; or to contribute to the contemporary in a creative way, going beyond the simple acceptance of the current anomy or the nostalgic degustation lure?

When we speak about taste we should keep in mind that it has not to do with an exclusive enjoyment, only for people that can afford it, but a crucial anthropological issue. At the same time we should be aware that the majority of world population, because of their difficulties to get access to food, has little chance to have culturally meaningful taste experiences.

In spite of the globalization of the agri-food industry and the resulting taste homologation and impoverishment of food cultures, the construction of the local sense of community, hierarchy and social distinctions, it must be understood in establishing connections with the outside: the cultural dimension of cooking and of food practices cannot be split from the formation of trans-ethnic and trans-national tastes, from relations of exchange, diffusion and appropriation processes.

The opposition between the globalized taste of the food industry and that of the regional ways of cooking, can be partly mitigated. In fact the regional cuisines are increasingly becoming exportation goods and destinations for an international culinary tourism (Poulain 2015). On the other hand also the serial products have to be readjusted to local tastes (Phillips 2006).

In many cases the relationships between the local and the global have to take into account several other levels like the aspiration to "national cuisines" that often become a tool , not without the risk of culinary chauvinisms, for the political construction of a nation (Appadurai, 1988; Belasco, Scranton 2002). From this point of view it would be appropriate to promote a greater awareness of the changing and historically made character of food traditions in order to mitigate all ethnocentrism.

In wealthy societies, where economic crisis is paradoxically going to disseminate food insecurity, the patterns of consumption are becoming more and more omnivores, while tastes are increasingly opening to curiosity.

Sensory food experiences tend to be reduced to the act of consumption: daily cooking time is decreasing (replaced by snacks, fast foods and restaurants services) while a vision of cooking is turning into leisure, as a strongly aesthetized and mediatized experience (Csordas, 2015). The consumption, notwithstanding the fact that it has been individualized, remains nonetheless a social act, a conclusive moment of a decisional chain about what and how to produce and to distribute, decisions that always concern environment, life and death of people and animals, aspects often hidden and unperceived. From this point of view, the impoverishment of tastes is not only due to a simplification of flavors, but also to the loss of symbolic dimension, to the inability of creating meaningful relationships, whether "around the table" as much as by the retailers and the producers as well. If the only choosing criterion become the free individual pleasure (influenced in fact by advertising and marketing), taste becomes de-socialized and backed out of any kind of sense of responsibility. In an opposite direction seem to go the critic patterns of consumptions, which move from concerns of social justice and needs of simplicity and frugality. In this heterogeneous world, which gathers spontaneous associations (like GAS, Solidarity Purchase Group), Onlus (like Slow Food) or leading food businesses (like Eataly), matters of taste combine ethic and aesthetic attitudes, because "Today the paradox of pleasure is right in the rigor that you should impose to yourself in order to reach it" (Petrini, 2001). In this way, frugality turns into distinction, altruism is practiced through consumption experience and social engagement becomes 'cool'. While running the risk of a reduction of culture to a range of aestheticized products, these experiences indicate a path to simplicity, quite different from levelling and simplification.

The creation of new ways of life also requires an aesthetic work, as in the case of ecological design for foods (Finessi, 2013). It involves creative socialized practices, as in the forms of participatory design (Fuad-Luke, 2009) or practices which could tomorrow be within the reach of many, favoring customized aesthetics of food, as suggested by the 3D printing or the possibility to produce meat "in vitro" in their own home. These examples show that in addition to the "alternative" forms of consumption, other social forms can be identified, in which "corporate convergence coexists with grassroot convergence" (Jenkins, 2006). Today forms of the consumption increasingly require the active intervention of the consumers who claims their autonomy, through unexpected and divergent uses of goods(Miller, 2010). Here new socialized food practices could arise, that would be more in tune with the "liquid" social relations of today. The experience of food goes more and more through the mediation of images: those of advertising, television cooking shows, food packaging or specifically created settings to sell and consume food. Especially in the arts the relation with food appears increasingly more relevant. From one side the food-art connection becomes a sort of cultural commodity that boosts the touristic economy (for example the combination of art exhibitions with wine and food tourism), and from the other side it blurs the line between culinary art and the art made by artists. Not only many artistic works actually

consist of cooking and modeling food, but also well-known chefs, in the role of artists, are invited to take part in the Biennales (Perullo, 2013).

Beyond the artworks created for exhibitions, there are also projects, such as that experienced in Lab Expo (Bargna, Scardi *Food which links and food which separates. Feeding, art and anthropology*) in which artists and anthropologists work together in socially sensible fields, in order to better understand problems. The arts rely on daily life as many creative professions rely on arts. This is the case of the food designers (Simonetti, 2010; Mangano, 2014) that project "food objects" and plan "food architectures" or the shop fitter (from supermarkets to restaurants) that has to set up multisensory contexts encouraging consumption. The risk is that the food will just turn into an "object", carefully designed but ephemeral, free from all communities of practices and life contexts. The spectacle of cooking is not confined to TV screens but is spread over many media platforms leading to the proliferation of show cooking, home contests among friends, and food and wine tours, which replace everyday cooking with "exceptional events". Even here, however, the re-modeling of food not only meets commercial needs, but it can also help sustainable development policies, as in the case of projects to promote insects consumption in the West, through a remodeling of the insect meat, aimed to inhibits Western dislike.

In conclusion, if it's true that the taste dimension is one of the domains throughout which culture is produced in complex and diversified patterns, the homologation and privation processes linked to tasting experience, act as deculturation and dependence patterns affecting the quality of life of people. Thus, the taste issues could be reformulated in terms of cultural rights, the individual and collective right of getting healthy and satisfying food, good to eat and to think as well. It is time to foster that kind of convivial situations (Illich, 1973; Caillé et all., 2011) in which the *care for the forms* of the relationships with the world, the food and the people, takes an ethical and social value, promoting responsible consumption, self-production and local scale distribution. Sensory and aesthetic experience of food appears as one of the ways of dealing with the world and the others: through the taste, senses meet meanings, and they give "flavor to the world", feeding the "taste of life "(Le Breton, 2006).

Food and belonging: bodies, territories and agri-cultures

Following large-scale industrialization of agriculture and agro-business, food cultures have radically changed in southern and northern countries: a disjuncture has imposed more and more between the farmers or those who produce food, the consumers and their territories, and the cultures and 'agri/cultures'. New modes of production in producing and thinking food have inevitably modified the ideas of locality and of local autonomy, the notions of nature and of the environment. Wide "processes of separating agriculture from ecology, production from consumption and reproduction, and the increasing desymbolisation of agricultural land" (Vasavi, 2015) have taken place. Not only at the local level in Lombardia region, but even more at the European and global scale, agriculture is undergoing a strong agrarian crisis of unsustainable development models, strong social fears connected to food crisis or of food manipulations and diseases, increasing risks of rural land abandonment, even

more in hilly or mountain areas. Furthermore, the consumption of soil in peri-urban contexts are extending, while intensive are the rural transformations in connection to the global dynamics of agro-food industry. The management of common resources, as land and water, shows the strong contradictions of intensive modernization paradigms and reveals at the same time, its political character at center of the public debate and social movements towards a new frame of agricultural citizenship: "resulting from these processes are conditions of erosions of plural agri-cultures and rural societies, which experience a loss of identity, agency, and agrarian citizenship"(Vasavi, 2015).

In the globalization context characterized by disorientation and by the redefinition of the sense of belonging, how to reconnect food, territories and agri/cultures? what is the symbolic and material role played by food in the definition of cultural identity or otherness?

Facing the widespread political and social attention connected to sustainable models of development, to food security and sovereignty, the analysis of rural contexts are often restrained by a reductionist perspective, unable to understand the complexity, the heterogeneity and the dynamics that are today at stake in agricultural and pastoral areas, even more from the perspectives of small producers. It is therefore crucial an analysis of the development models that are at stake today and a special attention to the relationship between societies and environments, condensed in the ideas and practices in producing and consuming food. An image of a "virtual agriculture" has often taken place (van der Ploeg, Renting, 2000; 2001) within modernization theories based on urban and western perspectives of food intensive production, a stereotype of "farmers" distant for the multiplicity of roles played by agri/cultures in contemporary reality. Going back to the livelihoods and comprehension of small and family farmers and producers of food is the first step to rely on "farmer resourcefulness" (Ayeb) and not amplifying the increasing dependencies and policies, which may become more and more distant from local realities. As anthropology of development has taught in decades (Arce, Marsden 1993; Olivier De Sardan, 2013; 2015; Long 1992, Grillo, 1990; Hobart, 1993), rural contexts are political arenas and "*battlefields*" between different ideas of community, of territory and their relationships, between different projects activated within modernization programs, multiple social strategies where the economic dimensions of food are embedded in the social and cultural reality and cannot be reduced to a mere technical and economic sector.

Food is connected to its scarcity and famine in many countries, its unequal access in quantity and quality and to food crisis, where strong stereotypes are mediated between us/them, north/south of the world, which avoid reading the social and economic dynamics as they are perceived by the local populations: the coping strategies, the relationship between food crisis and structural economic problems (as agro-pastoral realities), migrations, patterns of malnutrition, dynamics of poverty and the encounter with aid machine in food distribution, which often works following strong cultural misunderstanding or introducing new political realities in the distribution of resources. Different humanitarian modes of food aid face strong misunderstanding of local realities while "coping strategies by peasants are partly oriented toward making their

best of these modes or working around them" (Olivier de Sardan, 2015). A constructive critic to aid policies should be thus at stake: "these imported norms do not fit with many local norms regarding household budgets, mutual assistance, vulnerability, or community relations. Accordingly, they are circumvented" (Olivier de Sardan, 2015). Besides, "connecting food to the contexts where it is produced and consumed means also to have a close look to how disconnections happen" (Rossetti, 2015), as multiple example of cash-for-food aid for women in Africa show, where facing these financial policies, women "are too poor to save" and their patterns of resistance shows a way out towards new forms of agency, "ownership" and control over the processes of exclusion.

Agricultural patterns are interconnected to cultures and 'agri/cultures': system of values, of belonging, of local experts systems and knowledge patterns linked to local "savoir faire" and incorporated knowledge, all elements which are at the base of the production of "diversity" (cultural, economic and ecologic). In rural contexts, patterns of knowledge in farming and producing food are not always coincident with oral or written patterns of knowledge reproduction and transmission, since they constitute practices of locality (Ingold, 2004), knowledge patterns deeply linked to their territories and landscapes, to historical relationships to their environments and to moral and aesthetic patterns in relating to farming. Ethnographic perspective, which focuses attention to daily social and cultural patterns, allows revealing the social dynamics, the local resource management patterns and cultural strategies in facing the intensive changes and processes of exclusion in food production and in environmental relationships. This means facing actual changes following models of co-production of societies and environments, putting back agriculture within the eco-systems. This allows to focus on the ecological limits and on the "cultivation of diversity" in farming, which are often valorized by local patterns of management, and to take seriously local practices and knowledge system in food making, which are often connected to ethical and moral notions of the work of the land.

Food cultures in local cultural contexts are the results of different social and economic patterns in producing food and relating to the environment. The diversity of these food cultures are connected often to the reproduction of biodiversity and of landscape heterogeneity: models of development have to interrelate with these local systems that have been left aside for decades, not as an heritage to idealize but as an active actor of dialogue in order to avoid the increasing dynamics of exclusions and inequalities in food production and in the access to food. Moreover, food as agri/cultures is inevitably a social endeavor and a "social agriculture": "NGOs, not-for-profit organizations, local health agency and public services are engaged in building territorial alliances to promote social inclusion through the active involvement of the socially excluded and vulnerable individuals into the processes food production"(Saverio, 2015). Understanding the meanings of food –and of its scarcity, unequal access and of famines- in contemporary world relates to the deep disjuncture between food (and who consumes it), the territories where it has been produced (more and more distant and unknown) and the cultural systems (as patterns of knowledge, of work, symbolic and political relationships of agricultures). Food is often isolated from

its land and resources, and from the work patterns that produce its diversity, sustainability and multiplicity of cultures and environments.

Reconnecting these three dimensions in planning and local participation is the premises for policies, closer to the needs of involved population. Sustaining emergent and alternative networks of food production, of distribution and of consumption (as Gruppi di Acquisto Solidale and Distretti di Economia Solidale in Italy, seeds banks, local rural networks of food security) and the new ideas of food as social and political critic are today a challenge for a truly participation for a sustainable change: they are called Teikei in Japan, CSA (Community support agriculture) in the US, ASC (Agriculture Soutenue par la Communauté) in Québec, Réciproquo in Portugal, Swani Ticca in Maroc, ASAT in Roumanie, AMAP en France….they provide to producers the right payment for his work and to the consumer healthy food to feed the family, in proximity, which allows to the farmer to feed his family and to exist…» (Vuillon, 2015). Local food movements and solidarity economy networks around food are today a form of active citizenship: "from bulk-buying collectives to food coops, from urban community gardens to community-supported agriculture; from the development of small workers' cooperatives to ambitious plans to create "green" jobs for marginalized youth in postindustrial wastelands" (Grasseni, 2015). Even Milan and Lombardia region display a diffused mobilization of local actors that are reconnecting society, agriculture and food consumption at the territorial base through local networks, engendering trust and transparency in the chain of making food and searching for a pattern of co-production in making food: these innovative, although marginal and marginalized experience, are "down to earth" and innovative example of a new "agrarian citizenship" for sustainable futures of food. These patterns of innovation are often linked, in Italy and even more in southern countries, to the search of social cohesion, of ecosystem synergy, of critical attention and sustainable change of urban-rural relationships through food. Models of change are already "in the fields" and these local challenges, economic and cultural at the same time, display important contemporary questions linked to food, but reconnect at the same time the diversity of food, its environments and producers directly to the "table". Not less important is the centrality of the body as a medium reflecting the relationship between production and consumption spheres. The pervasiveness of food is well visible in the act of incorporation, which is fundamental in the construction of individual identity: food, a liminal substance that cross-cuts the boundaries of nature and culture, inside and outside, Self and Other, forces the individual to manage anxieties related to potential – real or symbolic – poisoning (Fischler, 1992) and to commit to choices that are often durably and indelibly marked on the body. There is a close bond between body and food (Lupton, 1996) and both notions have undergone significant historical, social and cultural changes in recent years. Socio-anthropological scholarship has documented the shift from a conception of the body as "open" typical of pre-modern societies, where the single individual and the body were assimilated to society through rituals, to a performative conception of the body as inherently "closed", typical of modern societies, where the individual asserts control over his/her own corporeal boundaries and chooses what to assimilate. In contemporary society, the body is not the natural site where culture is inscribed, but the material basis to forge, exhibit and revoke plural

identities (Le Breton, 1990). It is a project, a task, a result and a challenge; it is a responsibility: being in bad shape, or being ill are indicative of scarce self-control and represent a form of failure in the personal management of one's body. The emphasis on individual responsibility and the dichotomous distinction between good or bad aliments, healthy or unhealthy food, just or unjust alimentary habits –a categorization that pertains individual behaviour and global responsibilities (environmental and biodiversity protection)– distinguishes food consumption from other forms of consumptions. Furthermore, and most importantly, it underlies the moral connotation assigned to food-related practices and to consumer: a "bad" aliment is harmful to one's health; its ingestion is sign of moral weakness and scarce self-discipline; vice versa, "good" aliments are healthy and the sign of moral strength and self-discipline. If such taxonomies insist on self-discipline, alimentary rhetorics that promote alternative forms of food consumption insist on personal responsibility; in either case, "good food" is also "just" (Petrini, 2011). In contrast with "traditional" societies where a collective order – a *gastronomy* – is created through the ingestion of food, nowadays the coercive bond of alimentary practices seems attenuated.

Individuals are progressively less aware of the origins of their aliments, their modes and times of production and the importance of power relations that lie behind food and food-related practices. Food has become an opaque object ("as a result of disjuncture between food and who consumes it", Nicolosi), less invested with symbolic and belonging connotations: the industrialization and the distribution of aliments are perceived as detached from the act of consumption and aliments themselves are progressively separated from nature; as a result the consumer is kept away from his/her bio-cultural universe.

Food is a mere commodity and individuals are reduced to mere consumers. Such process is similar to the current individualization of the body, which separates the individual from society as a whole (Le Breton, 1990). At the same time – however - it is revealing of a diffused sentiment of regret for "food as a means of sharing and intimacy" (Favole, 2015), a nostalgia for a time of perfect reciprocity in the relation between men and food, once mediated only by close social relations and intergenerational knowledge, much similar to the idea of "structural nostalgia" elaborated by Michael Herzfeld (1997: 109) with reference to the political arena. As a result, a growing number of individuals have become aware of the over determined nature of their alimentary choices, have voiced critical concerns towards the assimilation of aliments void of identitary character, and have embraced a new-found interest in the idea of food as a means to assert identity (Manceron, 2014). Sociologist Guido Nicolosi (2007) has elaborated on the notion of *orthorexia* to metaphorically define a prominent feature contemporary society, one that is characterized by a high degree of reflexivity at the level of alimentary practices. Such hyper-reflexivity is presented in its various meanings: dietary (fitness), ethical (critical consumption), aesthetic (food design), symbolic (slow food), psycho-pathological (alimentary disorders) and translates into a modern *gastro-anomy* (Fischler, 1992), the superabundance of food and contradictory food-related discursive practices and the simultaneous lack of social criteria and social control over alimentary practices and

dispositions.In that loss of collective references, food has been the subject of numerous shifts in meaning over the course of the years, and has undergone a process of progressive individualization: it has gone from being a private practice and custom, an act of care, responsibility and the symbol of female virtue in the domestic sphere, to being recognized as a public phenomenon, an index of personal care, of recreational activity, of creative endeavour at all levels (private, public, virtual), the starting point new forms of sociality based on common interests, values and tastes (for instance the proliferation of organizations that promote sustainable food consumption, alternative food networks, both institutionalized –Banco Alimentare, Last Minute Market – and unstructured movements – Freeganism, Gleaning, Movimento per la Decrescita Felice (Guigoni, 2015) – community-supported agriculture (CSA), cooking classes, alimentary-related blogs etc.). Food has become pervasive, and flexible. Its "magic" quality, its ability to mediate well-being or illness, to aggregate, to create social distinctions (Bourdieu 1979), to influence social behavior and consumption make it a good example of "total prestation" (Mauss, 2002).

To find out the identity meaning of food means also to think about food as a cultural product, a vehicle of individual and collective identities. Food is conceived in relational terms, ecological, social and commercial. Organic-related food practices and modes of consumption – a inherently heterogeneous category that includes a variety of aliments, modes of production, distribution and consumption and various social actors more or less actively involved in the search for valid alternatives to industrial food chains – represent a viable path to overcome the limits of food as nourishment concept.

This alternative approach suggests a holistic vision of food, no longer considered as a mere object but as a relational construct, from an ecological (the relation with the environment, the animals and the plants) and social (the relation with the producers) point of view. A healthy diet is no longer determined by the ingestion or the exclusion of determined nutrients but by the idea that the health of the body and that of the environment are interconnected. Eating, here, becomes "an agricultural act" (Berry, 1990): food consumption influences agricultural practices that, in turn, have an impact on the ways food is transformed and consumed, with important consequences on the quality of life, on the individual's health, on the beauty of landscapes, on the well-being of animals, on biodiversity and earth. From this perspective, eating is an economic and political act and social actors are not passive consumers: they are co-producers, co-participants of the food-chain, responsible for their alimentary choices and the social and ecological consequences they entail. The social actor becomes an intentional agent, no longer individualized and more involved in the social and environmental dynamics that interconnect men and food (the reclaim of the social dimension of food and its relation with nature). Food regains its symbolic value, the sign of belonging to an integrated world where nature, culture, consumers and producers, individuals and society reunite.

Food Heritage

The main issue of the topic food heritage has gradually emerged in the context of the scientific direction of three events (two workshops and a lecture) and the lectures given during the advanced training course of Anthropological Cultural Heritage during 2014. Experience of research and teaching have interacted with the more specific and pioneering role of wine heritage to promote the recognition of a much wider understanding of "food heritage". The debate amongst colleagues engaged in the events has led to the agreement that in order to speak about food heritage, it is necessary (for scientific and communicative ends) to define first and more generally the meaning of "heritage", and then of "food heritage" in particular. After the recent debate on the cultural wine landscape, it is in the category of Intangible Cultural Heritage (whose definition is increasingly contested and not adopted by all UNESCO state members) that food practices officially enter into the dynamics of heritage institutionalization. Despite their being material, food practices are deemed as Intangible Cultural Heritage by UNESCO. Michael Herzfeld (Harvard University) disagrees with this distinction: *"I believe in Gian Battista Vico who assumed the centrality of thought as part of the corporality itself. As a material act, eating has some conceptual sides. For analytical reasons, we use to distinguish them, but they are different aspects of the same thing. Separating tangible from intangible heritage and situating food from one side rather than the other it doesn't make much sense, because nutrition is both"* (Herzfeld, 2014).

Food practices as an institutionalized category within the wider domain of Cultural Heritage is quite recent. Initially in Europe and then in other continents, changes in food culture have brought the development of cultural policies, alongside agricultural policies and tourism that have influenced them. The focus of these policies has been directed toward the heritagisation of products, territories, food practices and diets. This implies decisions, exclusions and conflicts: since not everything can be turned into cultural heritage, not everything is transmissible. According to Charles-Édouard De Suremain (Institut de Recherche pour le Développement du Musée National d'Histoire Naturelle, Paris) we could talk about: *"Horizontal and vertical transmission"* (De Suremain, 2014). De Suremain argues that from a methodological perspective, one of the anthropological tasks is the study of the ways food heritage has been transmitted. The issue of transmission, in fact, is strictly related to food heritage education and training. Food heritage is here considered not only in its festive dimension, but in its everyday dimension as well. This growth of awareness about the daily feature of food heritage could easily be connected to the issue of food security. As De Suremain states, social change and cultural transformations could be responsible for drawing together food security, heritage and cultural practices. *"In the struggle for food security, there is the anxiety to influence directly the course of events".* Going ahead with his reflection, De Suremain suggests intertwining the implications of security, poverty and food inequality. His goal is to know if: *"Notions of immaterial cultural practice and food heritage are solvable into poverty issues. Put in other words, if these notions can resist the analysis of social, cultural, economic and political situations which*

are different from the historical conditions that allowed their own development in Europe".

What could researchers do to ensure that food heritage does not correspond solely to regulations, disciplinary norm, or other institutional criteria but instead that this type of heritage becomes a shared legacy, deemed a public good, guaranteeing food security, accessible to a wider population, and hence able to transform relationships between producers, distributors and consumers?

The lively international debate about heritagisation has made clear a general tendency to deploy abused and vague references to tradition, and a scarce memory of the historical processes. The anthropological research, adopting sometimes a critical posture, underlines the risks that food processes of heritagization could imply. In this sense, Herzfeld states: *"The risk is to stop a cultural process that is always in progress. Culture is not a fixed entity, it is a process, a flux. If we attempt to differentiate certain things, and affirm that they are our heritage, we thus detach them from their own social context too. Concerning food practices, if we decide that certain dishes are 'authentic' or 'original', belonging to a specific culture, at that moment we do exactly what archeologists usually do when they dig: destroying as they are digging. When we speak about food practices, as if they were a sort of heritage, I totally agree with the idea of preserving some dishes from oblivion. But the problem is that, in so doing, we create a sort of museum and a museum is not a thing alive anymore. That is the tomb of culture, that is the place in which culture gets reified and thus separated from the flux which defines it. In that way we get entrapped within the logics deployed by the national States. The UNESCO follows the same bureaucratic logics. If the national States have established that food is an intangible heritage, that's it. No way of discussion. We will end up with a series of lists and little lists of food considered authentic as heritage, and forget all those complex processes that produce hybrid food, for example".*

A definition of food heritage devoid of ambiguity cannot exist. Rather, the definitions are numerous, and loose. Since food heritage is both a commodity and a perishable heritage, it opens up to new paths of research and it needs to be more objectified. The challenges for anthropological research are multiple. Considering food heritage only in its institutionalized forms is not enough. De Suremain suggests that: *"It is time to reconsider the taken for granted opposition between the institutionalized heritages approved by the Ministry of Culture of the different nations, and UNESCO, and the spontaneous, bottom-up heritage constructions".* Seen from Latin America, where De Suremain undertakes his fieldwork, the difference between those configurations of heritage does not seem so clear: *"Institutionalized heritages cannot do without local and ordinary heritages".* Indeed, pointing at the ongoing process of transmission of food practices from one generation to the next as well as between cultures, and making efforts in order to promote a social and historical awareness about those practices, would offer greater dynamism to the analysis of heritagisation. Therefore, it seems necessary to critically examine the notion of authenticity that nowadays is strongly supported by the mass media. Herzfeld believes that authenticity is: *"a very dangerous word: not only because it is able to exclude, but also it is connected*

to power. The same logic underlying the concept of cultural heritage is based on the idea of authenticity as a natural and well-defined entity". Heritagisation requires both choices and exclusions at the same time. That implies the growth of potential conflicts and, for that reason, Herzfeld provocatively suggests considering social conflicts as part of the definition of cultural heritage. That means that social conflicts around heritage shouldn't be neutralized by mean of the power; rather, they should be included in dynamics that bring the concept of cultural heritage itself into question. De Suremain affirms that it is necessary *"to avoid the exploitation of the process of heritagisation and to give more space to values".*

The correlation between food heritage and politics unveils specific national policies pointed towards the reinforcement of their internal cohesion, through the institutional establishment of their cuisines. Herzfeld affirms: *"As Arjun Appadurai has demonstrated in relation to Indian recipes, there was not an Indian cuisine as we mean it today. Rather, a national cuisine has been created through of specific historical periods by means of cooking books. I believe that the same has happened in Italy and in many other countries. The gastronomy becomes an important element in the definition of a national culture directed to create internal cohesion. Therefore, the result is a bureaucratic culture. For a bureaucrat, it is very hard to define a cultural phenomenon as a continuous flux because he requires an immutable definition. I would prefer exhibitions about the brawls, difficulties, debates, exclusions, tensions and discontents that rise up in every attempt of heritagisation".* To some extent, the recognition of a collective heritage can become a resource for local economies. Herzfeld believes that *"an open debate on the processes of food heritagisation would be the right beginning for an anthropological research programme which focuses on the critique of the abuse of power. Asking why certain things are deemed as either national, or regional or local, is a key-question which leads to the core of the creation process of power relations. In my opinion, cultural anthropology has to be always political. Anthropology is the discipline par excellence that has the ability to recognize the working of power relations in the apparently insignificant details of social life. Food heritage has become a battlefield for a rather invisible fight among different political forces and other food activists. When we speak about policy, it is as if we were referring only to political elections and we surrender to the definitions given by the politicians themselves. Instead if we look at the micro-politics of social life, including food consumption, we access a much more intimate area: the one that both national and regional authorities often exclude us from. That is part of what I have defined cultural intimacy".*

Approaching the issue of wine cultural heritage from a transnational perspective, Marion Demossier (University of Southampton) highlights how the distinction between Old Europe and the New World has lost its epistemological relevance. Demossier wonders if *"the notion of private land heritage as World Heritage raises questions that so far have been considered as taboos within the debates amongst culture professionals and people working on cultural policies"* (Demossier, 2014). Demossier, starting from a broader perspective related to the emerging use of wine heritage as a locally distinct practice of place-making, problematizes: *"Heritage as a source of division*

and tension of the local-global connections. At the same time it is the subject of several financial speculations and its cultural integrity is at the centre of fervent debates".

The challenge posed by cultural heritage is that of moving from the original etymology of the legal term, which is conceived as private heritage often selectively transmitted from the family through father, towards a notion of cultural heritage which is shared, recognised, consciously and democratically participated in by everybody.

3. Sustainable development: the dimensions of development between equity and sustainability

While economic progress has contributed to the enrichment of the world – scientifically, culturally, and by providing large material benefits – at the same time, it has also produced harmful consequences and detrimental pressures on the natural and social environment. Nowadays, in fact, the sustainability of this development process is threatened by growing inequality in the availability of social, economic and natural resources; a persistent unequal access to fundamental factors for human development and dignity such as food, water and energy, socio-economic services and public provisions; an increasing vulnerability of certain regions of the world; and higher risk exposure for specific population groups, often unable to meet basic needs such as nutrition, shelter or basic health and education. Such situation is the result of the interaction of multiple factors, which drive the establishment, reproduction and transmission of social disadvantages. As remarked by Sen (2014), for instance, food deprivation is mostly a socio-economic problem rather than a narrow "food production problem" and hunger analysis has to take note both of economic determinants of food entitlement of families as well as the division of food within the family and the cultural and social norms that might contribute to determine such a capability failure.

Sustainable development is widely recognized as the development which meets the needs of present generations without jeopardizing the ability of futures generations to meet their own needs – in other words, a better quality of life for everyone, now and for generations to come, within the limits of the planet. It offers a vision of progress that integrates immediate and longer-term objectives, local and global action, and regards social, economic and environmental issues as inseparable and interdependent components of human progress. Two important components of sustainable development are discussed and analyzed.

The first component regards social sustainability, a concept that has not become a clear international concern yet. However, the human development approach provides some tools to formulate a comprehensive definition of it, identifying social sustainability as the set of circumstances in which large asymmetries of human freedoms[2] and opportunities within and across generations are being avoided. In this sense, social sustainability contributes to the pursuing of sustainable human development, which can be viewed as the "expansion of the substantive freedoms of people today, making reasonable efforts to avoid seriously compromising those of future generations" (Anand & Sen 1994). Human development qualifies therefore as a condition in which a set of human freedoms and opportunities within and across generations are identified, promoted, preserved and guaranteed. In this regard, we investigate the role that collective goods and factors of social disadvantage may play for future sustainability. The protection of the quality of collective goods, the guarantee of their equal access within a community and the removal of any possible

abuse have a direct influence on the sphere of human freedoms and contribute to shape overall social sustainability. Similarly, social disadvantage and its inter-generational transmission affect the degree to which opportunities and human freedoms are equitably accessible. The active role of human beings, acknowledging that people are first and foremost actors and agents of change not just consumers or people with needs, is crucial for social sustainability.

The second component relates to the unequitable access to resources, in particular to modern energy and adopts a particular focus on developing countries. Given its crucial role in guaranteeing basic needs and rights such as food, water, health and schooling, access to energy is an important element of sustainable development. Almost one fifth of the population still lacks access to electricity and over one third relies on traditional methods and fuels to cook with severe consequences on health. Improving global access to modern energy, while staying on a sustainable pathway, from economic, environmental and social points of view, is a great challenge for the future of humanity and of the planet.

Starting from the recognition of current problematic situations, *seeds of change* are outlined as possible ways to rebalance opportunities and quality of life: these may imply actions at all levels, top-down interventions that act through policies and institutions and bottom-up processes, which may involve different types of actors taking on responsibility. Such processes necessarily call for a paradigm shift, moving from a dissipative development model – largely based on a depletion of natural and social resources – to a conservative one, able to preserve and to renew the quantity and quality of natural, economic, social and relational resources. On our path towards a sustainable future without malnutrition or hunger, we need to cultivate better practices, policies and actions, which can contribute to *feed the planet*, now and for the future.

3.1 Collective Goods

Common resources such as fresh water, a clean environment, preserved forests, healthy nutrition, or durable peace are an important pillar for evening out human freedoms within and across generations. Being a vehicle for direct and equitable access to important resources across all socio-economic strata, they have an important **redistributive function**. Also, shared resources may be seen as a sort of **'social glue'**, which can contribute to a group's sense of belonging, cohesiveness and cultural resilience, when they comprise more than only environmental aspects, but also social practices or traditional knowledge or spaces for public discussion.

By choosing the term collective goods[3], we refer to common-pool resources, underlying that they are *de facto* used by specific groups in time and space, namely collectivities that can be found at different levels: local, national, regional, global. Collective goods can comprise a variegated list of tangible and intangible items, such as for example: the global maritime ecosystem, peace, quality of ground water[4], traditional agricultural systems, biodiversity in agriculture, shared landscapes - for

example in urban spaces –biodiversity in ecosystems[5], traditional knowledge (e.g. fishing and cultivating techniques), opportunities for sharing (e.g. food, experiences, knowledge), social capital[6], guarantees for qualitative food production (e.g. product denomination or transparency in productive processes), shared cognitive frames leading to agreements between parts (e.g. *soft rules* reinforcing or enlarging the reach of standard social contracts (Hassan 2014)), civic virtue.

Given the importance of most of the mentioned collective goods, it should be noted that potential conflicts around them may indeed arise because the protection of access of one collectivity may stand in contrast - and reduce - the access of another collectivity. The mere recognition of a collective good may require opportunities to meet, interact and exchange opinions as it must be recognized as such by a large majority of players. Therefore the protection of global collective goods seems to be tightly intertwined with participation and global citizenship (Vaggi 2014) as these trigger processes of commitment and awareness (Ibrahim 2015).

Equitable access to collective resources is one of the key elements of socially sustainable development. How can we promote and improve the protection of collective goods? Which actors and which tools play a major role in activating this process? Which are typologies of collective goods whose protection we should prioritize in the future?

Currently, the international economic system is challenging and **abusing** a variety of different collective goods that represent the foundation of local livelihood at many, different, local and global levels. In order to better understand these phenomena, in what follows we will concentrate on two examples: access to knowledge and the preservation of global marine ecosystems.

Access to knowledge can be conceived in multiple ways, ranging from universal education, to the right of information, including the traceability and transparency of certain processes (such as of decision making or of production).[7] Knowledge has become a leading driver of global capitalism, with a drastic increase of intangible goods being 'traded' within global markets (Pagano 2015). In this perspective, the main mechanism with which knowledge is being commodified is through patents and intellectual property rights, which represent the main incentives for investment in research and development. In the farming industry, the increased use of these tools, has led to a monopolistic market of basic agricultural products (such as seeds or fertilizers) which is putting many small-scale farmers at risk of continued sustenance. Where traditional knowledge such as the cultivation, preservation and reutilization of seeds used to be a collective good, this is nowadays threatened by a commodification of knowledge in which previously non-excludable resources are being transformed into private goods, creating a *de facto* "pan-positional" legal order[8] (Pagano 2007), which "grants an exclusive "right" to the intellectual property rights holder, while involving "obligations" (duties) for all other individuals" (D'Haese et al. 2007).[9] In this case, different collective interests, such as that of the scientific community to take

research in this area forward and that of local communities being exposed to increasing dependence from monopolistic or oligopolistic seed producers (e.g. Cornia 2004; Romano 2007) clash against each other.[10]

The global marine ecosystem is another example of conflicting collective interests at different levels. Oceans are a global collective good not only because they cover 70% of the planet's surface withholding a myriad of living species, but also because they deliver crucial services for the well-being of humanity. The global marine ecosystem is thought to significantly mitigate the effects of climate change and is currently representing our last wild reserve in which we have access to food by *hunting* (Boero 2015). Recent trends in overfishing have further shown how delicate the triangulation between international trade in fish, local exploitation of coastal fish stocks and ecological sustainability, which implies renewal of stocks, in fact is. In addition to the challenge of feeding the planet, oceans nowadays are subject to a number of additional stresses, such as pollution through rivers, increasing concentrations of plastic material in the open Sea and acidification that is itself driven by climate change.

Typical recommendations emerging from the *Tragedy of the Commons* literature rotate around the **definition of property rights**, but as for other collective goods, this also implies the difficult disentangling of 'ownership' and of boundaries of collectivities themselves: at which level collectivities may conceive themselves and at which level their (collective) action may find an access to institutions poses a challenge for both, global participation and the protection of common interests. The school of thought building on Elinor Ostrom's work has concentrated on the management of common/pooled resources, highlighting the **collective abilities for self-governance.** These may represent the most efficient way of protecting collective goods. In this sense, crucial elements for local interactions to become a vehicle of management are recognized to be the availability of adequate information on costs and benefits implied by the use of the collective good; a shared consciousness with regards to the continuity of collective property; a common adherence to reciprocity and trust within the group; relative stability of the group; relative stability of individual preferences within the group; collective choice-making rules that minimize transaction costs and free-riding within the group; ability of the group to adopt monitoring and enforcement mechanisms that are efficient and not too costly (Rossi 2011).[11]

Yet, more work seems to be necessary in order to "supplement purely institutional arguments with broader concerns of **social behaviour**, particularly the psychology of sharing and of social freedom" (Sen 2013, p. 18). Among the possible tools with which we can improve the protection of collective goods it is in fact necessary to comprise instruments for both, private and public actors, with a view to promote the shared consciousness of the importance and *reason* for protecting a particular collective good.

Given that the private and public sector need to collaborate and to further dialogue with citizens and local stakeholders, an open question remains whether and how collective goods can be protected by specific institutional set-ups. For this purpose, different tools and their combination throughout different levels might be necessary.

Well-functioning institutions can significantly influence the way how collective goods contribute to the availability and equal distribution of human freedoms. The preservation or the renewal of the quality of collective goods may indeed be regulated and enforced by institutions, just as equal access to their use within the collectivity may be shaped by the institutional set-up, e.g. the precise definition of property and user rights. Often the abuse of collective goods of a certain collectivity on behalf of another one may be linked to existing institutional arrangements at a higher level which either stabilize asymmetric opportunities (as in the case of patents) or de facto miss out regulating a specific object (as in the case of the global marine ecosystem).

In addition to possible top-down solutions, which may imply "regulatory multipolarity" and some sort of 'transnational rule of law' system (Hartman in Petersmann 2012, p.12), other bottom-up solutions may emerge. 'Issue-linkage' of different policy instruments may also be a way to combine existing efforts and resources without neglecting the issue's complexity. For example, different citizens, environmental associations and local or national governments might gather together in order to pursue the goal of protecting the global marine ecosystem. Issue-linkage is likely to be relevant not only on the supply-side (of policies for the protection of collective goods) but also on the demand side, through the creation of 'multi-layered issue communities' (Kaul et al. 2003).

No matter whether goals are formulated through top-down or bottom-up mechanisms, the need to coordinate actions vis-à-vis disputed issues in the international arena calls for **collective decisions**. Such decisions are often made at a supranational level that the voices of many relevant subjects may hardly reach. Yet, these voices include those of the individuals and local communities whose life plans and living standards are either directly or indirectly affected by such decisions (Ceva 2014).[12] Therefore, the **legitimacy of supranational decision-making bodies** in the light of the impact they may have on local communities is unclear and indeed calls for more sophisticated mechanisms of representation and outbalancing of interests of different collectivities in the public discourse[13].

Our analysis suggests that social sustainability[14] requires – across different levels – the preservation or the renewal of the quality of collective goods; equal access to collective goods within the same collectivity; absence of abuse of collective goods of a certain collectivity on behalf of another collectivity. For this scope, we may indeed need to breed different combinations of approaches at multiple levels.

3.2 Social Sustainability

Inequality is expected to play a major role in the post-2015 development agenda, given its **interdependence** with the key dimensions which are likely to characterize the new strategy: **inclusive social and economic development, environmental sustainability, peace and security**. It is therefore appropriate to accurately define the notion of inequality we are truly concerned about. As Amartya Sen (2014) puts it,

"food is not distributed freely in the market". Similarly, how much you can buy and how much you can produce on your own land is not equitably distributed. Those individuals lacking access to sufficient, healthy and nutritious food are often in a situation of social disadvantage, which affects their ability to buy or to produce the meals that they need. Today, those mechanisms that create and perpetuate situations of social disadvantage play a major role for access to food and for malnutrition, too.

The growing role of finance, together with the impressive economic growth of East Asia and of China are recognized as the two major facts having reshaped the global economic environment in the last twenty years of the XXth century (Vaggi 2014). For our global future, the decisions made on how to regulate global financial markets will play a crucial role: currently, what we witness is a "privatization of gains and socializing of losses" (Stiglitz 2009), with obvious regressive implications.

Financial globalization is supposed to significantly having contributed to wealth concentration. Wealth inequality might be harder to justify than income inequality. The latter maintains an intrinsic meritocratic notion, whereas the first somehow clashes on our "notion that talent and hard work can create a brighter future regardless of one's social standing at birth" (Mervis 2014, p. 836).[15] While the transmission of wealth may be relevant only among a small portion of the population, its effect on overall inequality is worth an in-depth analysis, as it resembles a *driver of inequality dynamics* in which the control over resources becomes more and more polarized (among others, Piketty 2014). Within the Western world, patrimonial capitalism leads to accumulations of capital that are not re-invested for productive purpose (Targetti 2014a), leading therefore to reduced growth rates, and higher incidence of unemployment, particularly among certain groups, e.g. youth. In developing countries, the effects of increasing global wealth concentration are different. Commodity prices, for example, which are increasingly traded on global financial markets, have become more and more volatile since 2007/08, leading to the first of two subsequent food crises, which have caused millions of victims due to unaffordability of basic nutrients.[16]

The international community should observe increasing concentrations of wealth with caution as these usually go hands-in-hands with increasing concentrations of power. As long as a small minority of actors is over-represented on a global financial market, it is likely that international institutions and the rules constraining the action and reach of these same financial markets will remain feeble and biased (Stiglitz 1999). The main risk of a return to patrimonial capitalism is of political economy type: the voice and weight of the extremely wealthy - whether private people or multinational corporations - may in fact undermine attempts of promoting social sustainability, especially when the protection of collective goods and redistributive actions may come at their costs.

Inequalities on the globe have of course existed for a long time: they are "a legacy of the Great Divergence that began 250 years ago, in which sustained progress in health and wealth in Europe spread gradually to the rest of the world." (Deaton 2014, p.783).

Although some state that inequalities seem to be inevitable, as if they were some sort of natural outcome (Cho 2014), social sciences have increasingly paid attention to identifying the forces that drive inequality: they are "many and potent. It is up to society to decide whether and how, to restrain them." (Chin & Culotta 2014, p. 821). Different researches tend to converge on the argument that inheritance matters: inter-generational transmission of wealth (e.g. Piketty 2014), of knowledge and strategic locations (Pringle 2014)[17] or of behavioural characteristics (Bowles et al. 2005) seems to be one of the main determinants of inequality of opportunities and achievements.

For the scope of understanding social sustainability, therefore, it seems to be relevant to think in a multidimensional way about inequality - and about the forces that drive its reproduction through generations. Today, we face in fact a global situation in which social disadvantage, to be understood as insufficient access to opportunities and to human freedoms, is still wide-spread and highly concentrated in certain geographical areas, among certain groups of people. The nature of its root causes may be very differentiated. In particular, people may experience social disadvantage due to their social class, or due to personal characteristics such as being a woman, belonging to a particular ethnicity or race or due to sexual orientation. Diverse policy responses may therefore be necessary (Gisselquist 2013),[18] whether they address the prevention of emerging disadvantage, or whether they counteract the spreading and perpetuation of existing ones.

Since the consolidation of the Human Development paradigm, social and aid policies around the globe have tried to actively promote education and health, in order to address the main drivers of social disadvantage. In fact, greater access to health care represents an important achievement for equality, as more healthy years of life represent the basic opportunity for the realization of any human freedom and must certainly be maintained and continuously improved in the future. Similarly, policies that focus on education are likely to achieve good results in overall, although they do not automatically resolve rooted inequalities (Reardon in Autor 2014, p. 848). The effect of schooling can indeed be viewed as multi-faceted: "Improving educational achievement, especially for those whose parents have relatively low levels of schooling, would reduce intergenerational transmission both directly, because of the impact of schooling, and perhaps also indirectly by providing a more open network of group memberships and mating choices that are less homogeneous by income class." (Bowles et al. 2005, p.21). On this regard, the acquisition of so-called private social capital that occurs at school represents a crucial resource for further opportunities, particularly in the labour market.

In line with national policy approaches, international cooperation actions, which focus on poverty reduction, have tried to tackle social disadvantage. However, their efficacy so far has been questioned. In fact, current development project management is viewed as having a series of limitations, often reinforcing existing social asymmetries instead of assisting to level them out (Frediani et al. 2014). People are treated as 'patients' instead of as 'agents', while we "have to go beyond the role of human beings specifically as 'consumers' or as 'people with needs', and consider, more

broadly, their general role as agents of change who can—given the opportunity— reshape the world" (Sen 2013, p.7).

How different stakeholders participate in the definition of targets of social change and their implementation is also crucial for guaranteeing greater symmetry in human freedoms and on this regard it is worthwhile to mention that participation and agency[19] tend to assume different forms according to the specific context where they may take place. Participation is not only a valuable goal in itself, it may also be instrumental for other objectives. For example, spaces of participation may provide those means for preserving and renewing social capital, intended as the stock of reciprocal knowledge and trust existing in the societal fabric (Campiglio 2014).[20] They can also promote 'the social mix' as they "offer the opportunity to cultivate social ties within different social settings and to gain a sense of connectedness, belonging and identification with a community, leading to a higher social well-being" (Hughey et al. 1999 in Cicognani et al. 2007).

Most people lack assets and power to individually change their situation, but collectively they can achieve more (Stewart 2005, p.195). Widespread participation is understood to be an instrumental and intermediary step if different groups and interests are to be adequately formulated and represented within democratic deliberation. The virtuous role of widespread participation can, nevertheless, only be fully displayed in contexts where some basic institutions for the protection of civil society are in place (Gisselquist 2014), e.g. freedom of association, of movement, free and independent media, etc. are all elements that constitute the basis of informed citizens participating in the public discourse. Further, any social interaction - somehow implicit in the notion of participation - is "extensively dependent on a relationship of trust and confidence where citizens are able to tangibly experience the benefits of their participation (Esau 2008, p.360, emphasis added). This in turn depends on existing levels of inequality (Osmani 2014).

Participation is tightly linked to the reinforcement of *global citizenship* and the quest to increase **shared global responsibility**. This implies '*localizing global problems*' at different levels and remains 'the main political challenge we are facing'" (Lamy in Petersmann 2012), especially for what concerns the potential harmonization of actions between different levels.

Unequal access to socio-economic opportunities is a major constraint for a sustainable future. Further, intra and intergenerational inequalities weaken social sustainability and require global responsibility. Which factors of socio-economic disadvantage and their transmission should institutions and other relevant actors target? Which are appropriate methodological and policy tools for this scope?

Inequality in human freedom and opportunity can be reduced with alternative policies[21]. These policies can be analysed with reference to i) the cost for society; ii) political feasibility and iii) efficacy (Targetti 2014.) Normatively speaking, it is easier to

conceive changes in distribution in favour of more disadvantaged individuals by *improving their* human freedoms and opportunities, in order to let them "catch-up" with those that are better off. Yet, when resources are scarce and concentration levels become high, the need to recur to redistribution in order to guarantee acceptable, minimum levels to all might become necessary. The challenges that policy-decision makers face, therefore comprise different aspects: on one hand **the identification of which socio-economic factors should be targeted** and improved among more vulnerable people, on the other hand the decision **in which cases** the asymmetries in opportunities are so large - and overall resources so scarce - **that redistribution of those factors is required.**

Within the on-going debate on concrete proposals for action, some seem to be particularly worth mentioning as possible 'seeds of change' for a socially more sustainable future.

- To avoid increasing wealth concentrations at the global level, Piketty (2014) has advanced a policy proposal consisting in a progressive annual tax on individual wealth, basically on "the net value of assets each person controls". Such a tax could constrain the perpetual increase in global inequality, increase financial transparency, prevent financial crises and provide resources for new social policies, new institutions, the protection of collective goods and broader forms of participation. Technical difficulties for the implementation include the definition of the tax-basis, which rates should apply, how tax havens should be convinced to give up their *financial opacity*.[22] These however are not overwhelming (Targetti 2014) as some rudimentary forms already exist in most advanced economies.[23]

- Food security in developing countries is today strongly affected by speculative actions,[24] which lead to unforeseeable and unmanageable influences on international food prices (Sassi 2015). In line with most recent recommendations of international agencies (CFS 2014; FAO 2011), no speculation on basic necessities such as food (no matter whether crops, fish, meat, and water) should be allowed, as the side effect of the volatility on global financial markets may cost inacceptable numbers of human lives.

Main challenges to both policy options are their political feasibility and that international collaboration is indispensable.

- In order to level the playing field, there is clear necessity of interventions that come **earlier within the life-span** of a potentially disadvantaged person. In this sense, generalized and high-quality access to pre-school services is recognized to be more efficient and less costly for reducing inequalities in the long-term.[25] The same applies to nutrition, where it is well known that insufficient or low-quality food-intake during early life can lead to irreparable long-term damages in health and cognitive skills.[26]

- Under debate is the inclusion of other social policy targets, such as **social skills** that are transmitted from one generation to the next - and that are main

determinants of access and success on the labour market. Some of these are directly connected to behavioural characteristics (Bowles et al. 2005), such as collaborative attitude, ambition, orientation toward the future, sense of personal efficacy, work ethic, risk-taking etc., which makes policy interventions delicate and disputable. Social skills are predominantly learnt and copied within the family environment and may have life-long implications when they include disrupted family-ties due to experiences such as violence, sexual abuse or drug addiction.[27]

- Horizontal and vertical **connections** between complementary sectors of action need to be improved. The neat distinction between policies that address education, health, social assistance, or support to small-scale production is likely to miss out interdependencies and crucial mechanisms with which social disadvantage gets perpetuated.[28] Especially food security requires the collaboration of different policy sectors and actors.

- Spatial segmentation of people suffering social disadvantage may prevent some open access policies from succeeding in the reduction of inequalities. Where the provision of public goods, is not accompanied by proactive attempts to promote social mixing, qualitative differences will eventually emerge and replicate disadvantage across generations. For example, investing in quality schooling may display an important life experience for the **mix of social classes,** if sufficient attention is paid to its combination with a planning strategy in which social classes do not end up being segregated in certain neighbourhoods/areas of the country.[29]

The realization of such processes requires a shared vision of society, which in many contexts may be hampered by existing inequalities and prejudices.

- Development projects can play a crucial role in providing greater space for agency to vulnerable people in the world. Therefore, they should support the creation[30] of principles and visions that lead to choosing those community-outcomes that are being valued by people. In fact, people should be considered as 'complex actors', by paying particular attention to what inspires their action.[31] The creation of spaces, "intellectual first and foremost" (Escobar 2001) should become the priority of development projects, not only to foster agency in the first place[32], but also because collective action - the coagulation of diverse local interests (Perri 2014) - may indeed be the most efficient way of protecting collective interests (Ostrom 2009).

- Beyond actions in developing countries, other mechanisms taking place at the global level have a crucial impact on social sustainability. On the demand-led side, an interesting role can be played by social movement organizations, which promote a political vision of consumption and mobilize consumers, emphasizing solidarity and the use of 'alternative' forms of consumption as means to re-embed the economic system within social relations (Forno & Graziano 2014, p.2).[33] These organizations tend to mobilize citizens via their purchasing power and action takes place on the market through political consumerism, where preferences are broadly of political and social

type and contribute to the creation of solidarity and of social ties reinforcing the ability of citizens to formulate collective demands.[34]

- A possible fruitful development of what initially may be just minority-driven, radical choices is that such behaviours borne on the margin of the consumers' distribution may in fact have important spill-over effects on the median (mass-) consumer, which also starts asking for "more responsible" types of goods, such as zero-mile food, sustainable fisheries, or fair trade coffee. Such evolutions lead to growing expectations towards the supply chain, including all actors along the global value chain.

- Within the private sector, **corporate social responsibility** is delivering renovated production processes that are more respectful of the environment and of social relations. Being object of continuous social pressures, multinational corporations are induced to avoid environmental and social dumping in order to maintain their reputation. More and more entrepreneurs, at different levels, interiorize the profound meaning of not only serving the market but also of producing positive externalities to society in overall. Yet the practice of corporate social responsibility often tends to remain one of *damaging and subsequent mending* instead of shifting to *prevention.* Especially due to their implicit connections with global institutions, the potential role and impact that multinational corporations may assume for public policy in the future is still relevant (D'Orazio 2015). The substantial content that corporate social responsibility will endorse can therefore play a crucial role in determining the realization of future scenarios. Will multinational corporations become "agents of justice under non-ideal conditions" (Hsieh 2013, p. 143), or will they de facto abuse of their political power to exploit and deplete global public goods while delivering minor compensatory services[35]?

- In view of enhancing global citizenship, the need to amplify participation opportunities should be matched with the expansion of the global responsibility concept. Apart from consumption and production-bound action, protests as a form of participation and as an expression of political agency are vehicles for participation and for global citizenship (Ceva 2015, forthcoming). Further, social innovation as a process of creating new groups and of reforming existing institutional frameworks, plays an important role in social progress.

- Actions to improve public discourse should be implemented: what seems to be necessary are **tools to identify and to handle views on what is right and what is wrong for different groups of people** (Vaggi 2014). Further, public discourse still lacks generalized agreements on shared meanings.[36] Guaranteeing participation to all groups of a society seems to require a complex set of elements, such as **spaces for encounter and exchange**, **channels of communication** between local group formation and the **institutional set-up** and tools for accountability (Frediani, Walker & Butcher 2013) that sustain trust in the participatory framework.

Institutions[37] seem to be appropriate tools for approaching inequalities and their inter-generational transmission, as they can directly and indirectly affect the distribution of factors that maintain or mitigate social disadvantage. Having a more "sticky" nature than policies, they bear the potential of representing long-term mechanisms of redistribution.[38] In particular, they may keep an eye on**equalizing 'background risks'**, too, especially in consideration of the *cumulative risks* that poor people are exposed to. These in fact are particularly relevant for those that suffer from chronic disadvantage: crop failure or rising international food prices will make a difference to the livelihood of the most vulnerable, just as increasing dependence on productive inputs will significantly affect the survival abilities of small-scale farmers. Further, institutions constitute the medium-long-term framework within which single policies and interventions are determined and designed. Any redistributive framework acting in favour of alleviating asymmetries by systematically enlarging the availability of opportunities to the disadvantaged, even when this may - sometimes - imply reducing the liberties of the less disadvantaged, should be anchored in institutions.

3.3 Access to Energy and Sustainable Development

Energy is a key condition to guarantee access to clean water, sanitation, schooling and business in developing countries and represents a key factor for growth and development. From a general point of view, it is still debatable whether access to affordable, reliable, safe and clean energy should be considered a human right or an instrumental right, as fundamental needs may be guaranteed through energy. However, not only the clear correlation patterns between modern energy and economic and human development, but also the strong evidence on the causal relationship of access to modern energy on welfare and quality of life are sufficient elements to clearly underline the crucial role of access to modern energy in sustainable development.

Access to modern energy services is intended as the access to electricity and to modern and clean cooking facilities. Access to modern energy may allow reallocation of household time (especially by women and children) from energy provision to improved education and income generation. People can also benefit from greater flexibility in time allocation through the day and evening derived from better lighting. It also allows access to IT and media. When combined with other infrastructures, access to modern energy services lowers transportation and communication costs, favors a better access to markets and information. Access to electricity may also improve rural productivity, due to the introduction of technology and therefore may directly contribute to household income and push labor supply in non-agricultural activities. It is also a key element for safer food processing and storage, for example through refrigeration.

Several rigorous impact evaluation studies, intended as those using counterfactual analysis and microeconometrics to attribute effects of intervention to outcomes in a casual way, suggest that access to electricity is a strong causal determinant of changes in labour market outcomes, as employment and revenues rise in connected areas.

Interestingly, such changes concern women and activities not related to agriculture. Access to electricity also seems to have strong impacts on schooling and household welfare. Conversely, evidence on the impacts of the adoption of improved cookstoves on health and household welfare outcomes is still quite scarce and inconclusive. More research is needed to enrich the debate, possibly coming from different contexts and products, given the high variability in technologies across the world (Bonan, Pareglio & Tavoni 2014).

The International Energy Agency estimates that currently 1.26 billion people (18% of worldwide population) lack access to electricity and 2.64 billion (38% of global population) rely on traditional cooking methods based on the use of biomass with severe consequences on health due to indoor air pollution and on the environment (IEA 2013). This is "only" 300 million people less than in 2000, the first year in which the International Energy Agency has started tracking electricity access data. The global trend hides very stark differences among regions (IEA 2014). While the disparity in economic resources allocation has been long recognized as an international issue by the global community, the lack of access to modern energy has been identified only recently as a global issue. The geographical distribution of such phenomena is not even across the world: 84% of people lacking access to modern energy services live in rural areas; people without electricity are mostly in developing Asia (51%) and Africa (44%), similarly those still relying on traditional cookstoves and fuels are concentrated in developing Asia (72%) and Africa (25%). Progress has been registered in some countries in Africa, but overall in Sub-Saharan African countries the extension of electricity access struggles to keep the pace with a fast growing population that outpaces the efforts in place (IEA 2014b).

Energy and fuel poverty are becoming more and more important even in developed countries. Since there is not a consensus in the definition, fuel poverty in developed countries refers to the situation whereby households struggles to afford adequate energy supply to satisfy elementary needs, in terms of space heating needs, water heating, lighting and energy for appliances and cooking. For example, it has been estimated that between in 2011, 9.8% of households in EU27 and 15.8% of households in the 12 new Member States could not afford to heat their home adequately (Thompson & Snell 2013).

The World Health Organization estimates that the use of traditional methods of cooking, through wood and biomass combustion, has severe consequences on the health of households, due to indoor air pollution. The recent Global Burden Disease study estimates that almost four million people die prematurely every year from indoor air pollution due to the use of traditional cooking fuels and stoves. Moreover, the extensive use of wood as main energy fuel impacts the local environment, due to deforestation, soil degradation and erosion. At global level, inefficient biomass combustion is a major determinant of black carbon, a contributor to global climate change. Moreover, emissions from cooking stoves continue to be a major component of global anthropogenic particulate matter (UNEP/WMO 2011) in particular in

developing countries, for e.g., in Africa and South Asia where emissions from cooking stoves are well over 50% of anthropogenic sources (Bond et al. 2013).

The issue of energy poverty is firstly tackled with targets at international level in 2012 when the SEFA - Sustainable Energy for All - program is launched, as one of the results of the Rio+20 Conference. Its main goal is to assure universal access to modern and sustainable energy by 2030, improving the rate of renewables in the energy mix and promoting energy efficiency. The objectives are to increase renewable energy which currently constitutes 15% of the global energy mix to 30% and to double the global rate of improvement in energy efficiency by 2030. Regarding cookstoves international initiatives, in September 2010, Hillary Clinton announced the formation of the Global Alliance for Clean Cookstoves (GACC), which calls for 100 million homes to adopt clean and efficient stoves and fuels by 2020 and aims to draw the international attention on this issue, by mobilizing support from a wide range of private, public and non-profit stakeholders at global level. Despite such praise for action, improved cookstoves diffusion is not part of the agenda of interventions by international agencies like the World Bank: by 2010 the World Bank financed less than 20 improved stoves projects worldwide, mainly in Sub-Saharan Africa (World Bank 2010).

The achievement of universal access to modern energy is also complicated by the urgent need of reducing the role of fossil fuels in the world energy mix in order to curb greenhouse gas (GHG) emissions. The (near) future risks of climate change have been underlined by the last Intergovernmental Panel on Climate Change (IPCC) report: this reminded to the international community - struggling to finalize a new global climate agreement after Kyoto - that global temperatures are projected to rise over the 21st century under all scenarios and called for action to boost mitigation efforts to curb GHG emission, which continues to grow driven by economic and population dynamics (IPCC 2014).

Investments to assure energy access for the satisfaction of basic needs require a substantial scaling up compared to the current situation. However the amount necessary to reach the target (45 to 86 G$ per year) appears negligible, about 3 to 5 per cent, compared with the investments needed to satisfy future energy demand, considering that the average global energy investments in 2011-13 equal to 1,600 G$ (IEA 2014, Pachauri et al. 2013). It has been shown that providing energy access to 3 billion people is likely to lead to limited impact on emissions and climate change. Most of the growth in emissions is coming and expected to come from the global upper and middle class; providing energy access for productive uses worldwide would increase energy demand by at most 10% globally, with limited impact on GHG emissions (0,7% according to IEA) and temperature increase even if energy was to be met with fossil resource (Chakrvarty & Tavoni 2013).

Provided all such elements, the main question arising is the following:

Access to modern energy services, environmental sustainability and economic development are sometimes seen as a trilemma: it seems impossible to reach all targets at the same time. How can these three elements be reconciled? What policies and strategies are needed to move in such direction? What is the role of the different actors and of the different levels of decision-making?

National and international initiatives being developed to tackle the challenge of universal access to energy and environmental sustainability do not seem sufficient. More effort is required by all subjects: governments, international agencies, private sector, NGOs, academia, communities and individuals. The following seeds of change should be taken into consideration:

- Policy-making and institutional framework

The first important role of politics lies in the definition of basic needs to be satisfied and guarantied universally from which threshold of quantity of energy needed could be drawn. Once such conditions are somehow met at national level, international coordination efforts in carrying on policies aiming at decarbonizing, stimulating private investments to improve the efficiency of energy systems and limit carbon emissions (by reducing the contribution of hydrocarbons to the energy mix) and collaborating to meet the objective of universal access to energy are needed.

Fighting energy poverty through, for example, the realization of electricity infrastructures, particularly large-scale ones, as well as clean/efficient fuel substitution or improved cookstoves programs require the direct commitment of governments both in terms of direct investments and of promotion of private-sector partnerships and investments, through adequate institutional infrastructures and regulation. Private sector investments for the expansion of energy supply are possible when the institutional and legal framework are favorable. Weak rule of law and property rights hamper investments. Corruption and lack of transparency should be actively tackled through adequate institutional controls and rule of law. New business models and mechanisms to incentivize private sector involvement and cost recovery should be developed.

Moreover, development strategies and consequent actions should focus more on the needs of local communities and include multidimensional perspectives and expertise. Integrating and coordinating these strategies depending on general and local considerations should guide the process of policy decision making of the public authority. Need-based approach focused on local communities in relation to improvement of access to energy should include the analysis of the following dimensions: affordability, quality (safety), quantity, sustainability, reliability and availability. Detailed local assessments of demand and options for expanding access, and their wider socio-economic and environmental impacts should also be considered in order to foster community empowerment. This approach should integrate and

complement the typical top-down decision making process, where priorities and implementation decisions are more centralized.

- Technology selection

Once universal access to electricity is set among governments' priorities, the challenges which need to be tackled, particularly in underdeveloped rural areas, relate to key strategic policy decisions regarding electricity generation, transmission and distribution.

Energy generation looks at the energy mix maximizing country energy supply unexploited potential, among traditional and renewable resources. Allowing access to electricity for large shares of rural population requires increases in electricity supply by investing in new generation plants employing different resources, depending on individual countries' advantages. For example, China responded to the increase in demand by expanding electricity generation through coal thermal plants (IEA 2011). It is estimated that solar and hydro power could meet a large part of Africa's future electricity needs. Wind and geothermal power can also contribute significantly in some areas (Sanoh et al. 2014). Different mix of policies and energy portfolios involves different investment commitments. According to IEA's New Policy Scenario, compared to 2012, global investments in clean energy should double by 2020 whereas to achieve even more ambitious scenarios the amount of global resources devoted to climate change mitigation should be about 2,400 G$ per year (in 2013 dollar), a substantial scaling-up compared to the baseline scenario (1,238 G$). The recent trends in climate finance are not encouraging: in 2013, global climate finance annual flows totaled about 330 G$ (Buchner et al. 2014).

Another important aspect is related to the distribution of energy supply. Grid extension remains one of the most common means of universal electrification, given the advantages derived from economies of scale in energy production. However, reaching rural areas with electricity is not as rentable as urban areas, hence strong commitment by governments is usually required. Alternatively, mini-grids can be installed when grid extension options seem too expensive or as back-up energy source in order to prevent the serious consequences of outages to key infrastructures such as hospitals or important firms; technical options include, for example, small hydro, biomass-powered generators, small geothermal, solar photovoltaics (PV), solar thermal, wind turbines, and hybrids consisting of more than one technology (with the possible inclusion of fossil-fuel-powered generation.). Dispersed renewables energy options using small-scale, renewable energy systems, including solar photovoltaics and wind turbines, are reliable and cost-competitive options for electrification of households in dispersed or isolated communities (for a review and classification of available systems and technologies, see Mandelli & Mereu 2013). Successful case studies on the implementation of renewable sources for electricity supply in developing countries, particularly in remote rural areas, are represented, among others, by solar home systems in Bangladesh as described in Khandker et al. 2013, hydro-power generation in Tanzania by ACRA-CCS, several joint projects of AVSI with some energy firms like

ENI, ENEL and ENDESA, solar electricity program in India by Greenpeace. Many energy access projects around the world have been collected and presented, with the aim of knowledge diffusion, by the website of WAME and Expo 2015 and within the "Best climate practices contest on energy poverty alleviation" by the International Centre for Climate Governance.

Regarding access to improved cooking facilities, local context plays an important role in the definition of feasible and sustainable technological solutions which may represent small improvements (not necessarily the best option in terms of efficiency, emissions, etc.) with respect to the previous technology, but that may assure some gains in quality of life and energy efficiency.

The introduction of new technologies should be always accompanied by a strong effort in local capacity building and awareness in the local stakeholder, in order to ensure the sustainability of projects.

- Financial mechanisms

The effort to universal access should balance the long-term sustainability of projects, essential in order to attract necessary large private investments, with the issue of access and affordability of the poorer. Affordability relates to the capability of household to be financially and economically capable to access and use electricity. Progressive tariffs, lifeline tariffs (households consuming below a certain amount per month receive a subsidy), targeted price support, subsidies on modern fuels or other innovative financing solutions, for example through microcredit, are among the possible tools governments can adopt to help access and use of electricity by rural and poor households (Winkler et al. 2011). Incentives towards greener and more environmentally sustainable solutions could be financed through the phasing out of fossil fuel subsidies (FFS), a rather common policy tool in many emerging countries. Even if FFS have the purpose to shield the fragile segments of the population, there is evidence that they are generally regressive, i.e. they benefit wealthy households relatively more (IEA 2011; World Bank 2014). FFS provide an incentive to use more carbon-intensive sources of energy and certainly do not help the pathway of decarbonization needed to reduce GHG emissions.

- Research

Research and academia can contribute to the improvement of different phases of the policy decision-making process through the support of impact evaluation and cost-benefits analysis to strategic decisions. Policy making should consider and be guided by scientific evidence based on methods and analyses that try to show what works and what does not, and possibly – most importantly but most difficultly – why, revealing key elements on the process of development. This can be obtained through the implementation of impact evaluation methods with the use of counterfactual analysis. At the same time, cost benefit analysis (CBA) provides, in broad terms, a systematic

way of comparing the costs and benefits of a project or policy so that project selection promotes the efficient allocation of scarce resources.

Technical and scientific research plays also a crucial role in the identification of technological solutions which can be implemented at local level in order to solve energy poverty issues.

- Individuals and informal institutions

Individual decisions over the adoption of products and behavior which may be beneficial to the quality of life, such as the decision to connect to electricity or to buy healthier cookstoves, is an important factor of development. A central puzzle in development is that effective, inexpensive technologies with the potential to address many of these problems exist, but are often not adopted or used by the citizens of poor countries. When analysing low levels of technology adoption in developing countries we must recognize that the poor face fundamentally different constraints than their counterparts in developed nations. People may simply not have the money (or willingness) to spend on a new product like an improved stove, when their outside option (cooking with a traditional stove) is free. They may lack information about the health consequences of their current practice. They may be too risk averse to spend money on a technology with uncertain benefits, especially when they are extremely poor and face competing demands for those funds. It is found that propensity to adopt modern cookstoves differs for women and men: women have a stronger preference towards the new technology but lack sufficient authority and bargaining power within the household to impose their decision on men (Miller & Mobarak 2013). It is also highlighted the important role of opinion leaders, peer influence, social learning and social networks in conveying information on the attributes of the new technology and decisions to adopt (Miller & Mobarak 2014; Bonan et al. 2015). Learning the drivers of adoption, diffusion and continuous use of healthier and more efficient products is of great relevance in order to strengthen evidence-based actions and policies. Further research should focus on the roles of household level decision making, gender, cultural traits, liquidity and credit constraints, but also behavioural factors, local institutions and social networks. Further analysis and investigation is needed to identify the effective (marketing) strategies and incentives structures which should be implemented by policy makers, international organizations, NGOs in order to diffuse the adoption of beneficial behaviours and products. Such strategies should be particularly focused on two types of actors:

- Informal institutions, largely widespread in the developing world, should be involved in diffusing good practices and technologies to a larger extent, given their potential in diffusing information, awareness and welfare improving behaviours and products.

- Women, who represent key players in many processes of technology shift. Starting from the fundamental role of women in development processes, some aspects of

energy access policies should be designed in order to have a greater impact on women empowerment.

₂ Asymmetries of human freedoms may be interpreted as inequalities of opportunities, whether these refer to accessibility of resources or of skills or the capacity to formulate own life plans and choices. While the notion of "large" leaves undefined how much asymmetry is tolerable, it merely serves as hint for the fact that great disparities are social injustices, whereas small disparities might not automatically imply such a tag.

₃ The term "collective good" is roughly used to identify resources – tangible and intangible – which can be freely accessed and used by the local collectivity. The concept is applicable at the local level but also in global terms, if the collectivity notion is extended to the population of the planet.

₄ At risk of extinction in 15 years affecting 40% of the food production (Borghini 2014).

₅ For our ability to supply sufficient amounts of food, it is crucial not only for agriculture but also for the ability of survival of entire ecosystems where we are still hunters-gatherers, e.g. in the marine ecosystem.

₆ Seen here as a primary input for both, institution building and participatory, innovative bottom-up proposals.

₇ Examples of recent best practices that promote the generalized access to knowledge are the Bolsa Familia programme in Brazil (2004), proactively broadening the enrolment to compulsory school via conditional cash transfers; India's Right to Information Act (2005): this act guarantees unrestricted access to any government document and information in a broader sense. This information has to be given within 30 days to any citizen who applies for it. The India's Right to Information Act is considered one of the most advanced in the world and more than one million applications for information are submitted each year. It has been able to produce a radical change and built up a culture of transparency in public life, reduce abuses of state power and corruption and foster accountability (J. Drèze & A. Sen 2014).

₈ Pan-positional goods are interpreted as being the opposite of public goods: they resemble cases in which the consumption of one individual excludes the possibility of consumption of all the others.

₉ Genetically modified seeds can only be purchased and not re-used the following year. Therefore an agricultural practice is becoming 'excludable' through the right attached to the patent of seed producers.

₁₀ Dependence on purchased seeds significantly increases production costs of local farmers and their exposure to stress mainly because their borrowing requirements rise in contexts where credit-markets are far from being thoroughly developed (Cornia 2004).

₁₁ As is easily recognizable, these preconditions are less likely to be simultaneously present, the more the 'collective' level is shifted upwards towards the global community, to continue with the previous example: e.g. global marine ecosystems. For a number of them, however, the role of freely accessible information, transparency and traceability is crucial, e.g. in the joint evaluation of costs and benefit of depleting the global fish stocks, reciprocity and trust between the different stakeholders, the ability to monitor and enforce collectively set-up rules.

₁₂ An example may be the supranational regulation of local systems of food production.

₁₃ For example, on the global enforcement of IPR, Pagano (2014) proposes to include in the charter of the WTO "rules stating that a fair participation to international trade requires a GNP fraction (increasing more than proportionally with national wealth) of each member state to be invested in open science and to be made available to all countries as a global common".

₁₄ As stated in the introduction, although no official definition of social sustainability exists, it is here conceived as "that set of circumstances in which large asymmetries of human freedoms and opportunities within and across generations are being avoided

₁₅ Normatively speaking, the challenge is to find equilibrium between tackling inter-generational transmission and avoiding the elimination of any continuity between parents and offspring.

[16] FAO estimates report an increase of the hungry due to rising international commodity prices. Due to the 2007/08 food crisis, the number of undernourished people has increased approximately from about 850 million to about1023 million in 2009 (HLPE 2011). The impact of rising food prices in 2010/11 is yet not clearly quantified, but they are thought to having significantly contributed to widespread social unrest, including the Arab Spring.

[17] "It is the ownership of small, resource-rich areas - and the ease of bestowing them on descendants - that fosters inequality, rather than agriculture itself" (Pringle 2014, p. 823)

[18] For an overview of different ways to conceive inequality, see von Jacobi & Bonan (2014).

[19] Agency is a fundamental element of human freedom and can approximately be defined as "the ability to pursue goals that one values and has reason to value" or as the ability ''to help themselves and to influence the world'" (Sen 1999, p.18), or as the "internal ability to make reasoned choices and to act accordingly" (Castillo 2014, p.80). Agency is a fundamental element of human freedom. Yet, agency and participation of poorer people is limited - leading to a systematic underrepresentation of their wishes, needs and proposals within the public debate.

[20] Social capital is instrumental for both, the creation of high-quality institutions and the concrete realization of participation processes.

[21] Social policies and permanent institutions are here intended to be **progressive** if they contribute to reshaping the overall distribution of human freedoms and opportunities, and in particular: in favour of the bottom of the said distribution. They may of course also be interpreted as contributing to the progress of social sustainability.

[22] For further discussion of technical choices that would be necessary in order to implement a global wealth tax, see Piketty & Saez 2013 and Targetti 2014.

[23] A more modest proposal built around the OECD members (or EU and the United States) according to Piketty (2014) is feasible. The recently passed US legislation (Foreign Account Tax Compliance Act) can be considered as one of the first steps that could lead to regional taxation of capital.

[24] Food prices are not solely affected by speculation but are the outcome of a complex set of different interacting factors, including increasing pressure due to global demographic trends, external shocks due to climate change, competing destination of productive soils (e.g. biofuels, urbanization), land grabbing.

[25] See, among others Barnett 1998, Anderson et al. 2003, Burger 2010, Gertler & Heckman 2014 and Obama 2014.

[26] On the role of maternal economic diasdvantage during the prenatal period and of prenatal and postnatal investment by families for health at birth and children's outcomes, see Aizer & Currie 2014.

[27] While it is difficult to make a generalized stand for public policies to intervene into issues of personality, attitudes and interests, it is worth mentioning that a range of works now start to suggest that psychological support should also be considered for novel intervention targets (Haushofer & Fehr 2014, p. 866).

[28] In Brazil, for example, the programme BrasilSemMiseria has heavily reinforced the cooperation between different social policy programmes and different governmental levels. For example, individuals that are found to live in conditions of deprivations by personnel of the social assistance sector are 'signalled' to other units, e.g. those protecting children from abuse or to the units enrolling poor families into the Bolsa Familia programme, which provides monetary support conditional on school enrollment and health checks.

[29] For some case-studies in which territorial segmentation is pro-actively addressed by public policies in defense of thorough social mixing, see for example city planning measures in Munich, Germany, and Vienna, Austria.

[30] Creation here stands in contrast to the implementation of principles and values decided by others, e.g. the donors.

[31] For an empirical investigation of how development projects succeed in creating space for agency and participation, see Ibrahim (2015).

[32] For an empirical investigation of how development projects succeed in creating space for agency and participation, see Ibrahim (2015).

[33] Innovative political consumerism is usually brought about by 'critical citizens' (Norris 1999) who may combine a "strong support to democratic principles with growing distrust towards public institutions and traditional representative channels". It typically requires high levels of education, access and use to new technologies of communication among wider sections of the population (Rosenkrands 2004). See also Alexander & Ussher 2012, Balsiger 2010, Grasseni 2013, Graziano & Forno 2012, Sassatelli 2006 in Forno & Graziano 2014, p.3.

34 Examples of political consumerism with such characteristics are the GAS - Gruppi di Acquisto Solidale in Italy and the AMAP - Association pour le Maintien d'un Agriculture Paysenne - in France. See, among others, Pelenc (2015).

35 In fact, a shift in the paradigm of competitiveness itself might be necessary in order to profoundly change this practice: if competitiveness could be interpreted more in terms of 'quality' than in terms of 'outperforming others', then our interpretation of sustainability and of competitiveness might somehow move closer together.

36 In the search of an overlapping consensus, consensualistic theories interpret agreements as circumstances in which parties eventually revise their initial principles and values, whereas compromise theories identify consensus in the small proportion of true agreement between different views (Zuolo 2015).

37 Institutions are social structures. They can broadly be defined as systems of rules. Institutions are usually defined as the rules and constraints within a given society. Yet - for the purpose of this study - it is more helpful to conceive institutions not only in this way but also as "safe-keepers" of particular social agreements that enclose values and collective choices.

38 Compare this rough definition with Sait (1938) "Institutions are coral reefs that grow by small accretions" (in Rhodes et al. 2006).

4. In search of the human city

Feeding the planet means feeding the cities, since the majority of world population today lives in urban areas; as more and more people move from rural areas to urban centers at a sustained rate, this will become even more evident in the future. As a result of these global urbanization trends, feeding cities has become a major challenge. In order to enable sustainable development of the city, health and well-being, cultural diversity and cultural identities, access to nutrition and food security for its inhabitants, we must undertake a complete reconsideration of the entire food system, from the growing and farming of food to its consumption and the subsequent disposal of waste. Cities, particularly in advanced economies, are engaged in food strategies that confront the wide variety of their developmental paths and the different ways in which the economy and society interact. Detroit and New York are the most prominent examples of food policy and the promotion of urban agriculture (Morgan 2009).

The importance of cities, however, goes well beyond the increasing number of people living in them. Cities play a key role in socio-economic development: 67% of the European GDP is generated in the metropolitan regions (i.e. large urban areas with more than 250,000 inhabitants) where 59% of the population lives. At present, cities are engaged in the remaking of political and economic space; it is within major cities and city regions that major transformations have occurred as dynamic reactions to the most recent economic and financial crises and attempts to revive socio-economic development have been devised and implemented. Spatial and social changes reflect the shifting away from manufacturing and real estate as drivers of urban growth to the new, emerging focus on knowledge, innovation, creativity and art in fostering socio-economic development in urban areas (Scott 2008; Storper 2013). As places of production and consumption, cities can be engines of innovation and mines of opportunities, particularly when mechanisms of integration are at work in sustaining a harmonious development of society and economy.

The idea of "feeding the planet" challenges us to ensure that we build the city along an integrative path, resulting in what we have called "the human city", a city that can be easily viewed with the "eyes of humanity", as suggested recently by Amartya K. Sen in his essay on global justice. In contrast, contemporary development trends are increasingly pushing cities away from a path of socially just and sustainable development that could offer a decent life to all city-dwellers; even in cities with a vital economy, we are witnessing a dramatic decoupling of economic growth from social development, resulting in all sorts of problems.

Our goal in what follows is to highlight the main obstacles that prevent the "human city" from flourishing and to identify seeds of change that represent a potential, if not already a definite trend, for transformation in the direction of the human city. Three

issues are particularly pressing: a) socio-economic development, b) democratic governance, c) social cohesion.

Socio-economic development has become an issue because continuous economic growth has come to a halt and there are serious threats of decline and stagnation in many cities. In general, cities face major difficulties in creating economic opportunities in a framework of high competition, shrinking markets and reduced resources. The contributions collected from experts all over the world point to new forms of production in the postindustrial city, in particular a collaborative mode of production based on the sharing of knowledge and skills, which has begun to emerge in several industries. In envisioning the possibilities of economic development, it is important to take into account the debate about the role of these new forms in the future of urban economies. What is certain is that they are emerging thanks to resources and conditions which are peculiar to cities.

The issue of democratic governance concerns the need for the city to identify new forms of political participation able to translate citizens' needs into policies and actions. Capacity building, learning and capabilities, accountability and transparency are all issues at stake when discussing forms of democratic and inclusive governance. On the one hand, there is a broad consensus as to the need to open up public decision-making processes and make them more inclusive; ICT technologies are seen as a strategic opportunity to enable such inclusive processes. On the other hand, many processes point to a weakening of democratic foundations and to an evolution toward post-democratic, oligarchic regimes.

The issue of social cohesion concerns the need for the city to overcome disruptive features of our "liquid modernity", such as fragmentation and individualization, and, more importantly, increasing inequalities, social polarization, marginalization and exclusion. In the face of these disintegrative processes, we discuss emerging practices of social innovation that aim to respond to unmet social needs through the re-organization of socio-spatial relations, the activation and empowerment of individuals and communities, highlighting their potential to resist and counter these exclusionary and socially corrosive trends.

4.1 Socio-economic development

The concentration of businesses, workers and consumers in cities produces socio-economic development. In the last thirty years, however, increased international competition has brought profound change to the urban economies of major industrialized countries. The knowledge economy, a new model of production based on ICT, innovation and knowledge, has emerged as the driving force of economic development, provoking dramatic changes in the way industries organize. Socio-economic development in European cities has become increasingly uneven and problematic in its effects on cities.

Due to increased international competition and the reduction of transportation costs, a substantial part of manufacturing production has been delocalized to emerging countries with low salaries and less restrictive labor and environmental regulations. A profound process of restructuring - in the form of a substantial outsourcing of segments of the production process and of management functions - has been implemented in all industries. The combined result of delocalization and restructuring has been a massive loss of both skilled and unskilled jobs, the destruction of human capital along with local knowledge and expertise. In addition, there has been a general fragmentation of large firms and an increase in the number of small and medium-size firms, which are often subcontractors. Smaller companies have become even more vulnerable to competition and market instability, which is reflected in increased vulnerability for workers as well.

Rapidly expanding sectors such as high-technology industry, financial and business services, media, fashion and cultural products (Amin 1994) have progressively replaced manufacturing industries. These new knowledge and cultural industries constitute the core of an emerging new economy in which cognition and culture play a fundamental role; in this emerging cognitive-cultural economy (Scott 2008) which has expanding foundations in science, knowledge, information and calculation, key sectors are those incorporating high added value from creativity and knowledge (Sassen 2009).

The concentration of assets in major metropolitan areas favors the development of this new economy: cities are sites in which many specialized but complementary firms are concentrated, where informal learning and innovation diffusion take place thanks to the presence of knowledge institutions and the proximity among highly skilled workers (Storper 2013). Major cities are also strategic nodes in global networks and are thus able to influence the reorganization of the relationships between economy and politics to their advantage.

All cities, however, face the brunt of international competition and struggle to find a distinctive path of development; models of the "creative" or "smart city" are centered on creativity and innovation, in whatever field they may find application. Indeed, creativity and innovation seem to have become the ultimate asset of every city in the construction of what makes a city unique, or at least more "special" than its competitors. As a consequence, in each country cities outbid one another with tax and infrastructure giveaways to lure "creative" new business to their turf; in this competition, cities enter into a zero-sum game in which few cities succeed and the vast majority lose, while resources are shifted away from policies designed to improve the lives of cities' inhabitants to those whose purpose is to attract businesses and high-skilled workers (Molotch 2014), which ends up reinforcing inequalities among and within cities (Storper 2013).

Even when a city wins this competition and establishes itself as creative and/or smart, its performance often fails to fulfill the promise of generalized, high-quality socio-economic development. Particularly in large metropolitan areas, the new creative class is highly differentiated: there is a prestigious upper tier of high-level cognitive-cultural workers able to reap the fruits of globalization and join the global elite, and a

lower tier which sees very little in the way of material rewards. It is within knowledge and creative work that project-based employment has quickly become established as a common practice, to the extent that one may speak of a substantial morphological transformation towards a freelance knowledge workforce (Gandini 2015). Among these creative freelance workers, a large segment lives in precarious and insecure conditions, characterized by low income, informality and reduced contractual protection. As McRobbie notes, "The creative sector finds itself full of young people who are burnt out, exhausted, unable to consider having children, and often self-exploiting on the basis of the 'pleasure in work' factor" (2010, p. 33). Nonstandard forms of employment have become the new standard in this industry, resulting in instability in terms of work flows and careers along with a dual labor market characterized by disparities in social protection: on the one hand an increasingly small group of insiders with stable employment and access to social supports (Kalleberg 2009), and on the other a growing number of workers with little or no social protection. Below the lower tier of the creative class there is an expanding new underclass which provides services for the maintenance of the basic functions of the city and the reproduction of the upper social groups. These low-wage and precarious service workers are often "working poor", as salaries from these jobs are likely to be inadequate to provide for basic family needs.

More recently, as a reaction to the creative & smart city model and its consequences in terms of social problems, cities are called upon to pursue paths to socio-economic development more attentive to sustainability and social inclusion. Instead of one recipe for all cities, diversified and customized strategies are to be devised, on the basis of the specific strengths and conditions of the locality and a clear and widely shared vision of its future. European cities are expected to follow different development trajectories so as to exploit their diversity and points of strength; competitiveness in the global economy has to be combined with sustainable local economies by anchoring key competences and resources in the local economic system and supporting social participation and innovation. This "smart specialization" growth model, proposed by the EU programme Europe 2020, calls for knowledge, governance arrangements and collaboration across all stakeholders -- public, private, the voluntary sector, academia, citizens – which are very hard to mobilize. This model, however, has little to say about the issue of shrinking cities in Europe; these are cities which have seen the outflow of capital and human resources and have suffered from both a lack of entrepreneurship and a low level of innovation and intellectual engagement; in such cities with a long-term demographic and economic crisis the dominant growth orientation may intensify the negative consequences of shrinkage.

The recent economic and financial crisis, whose negative effects have yet to completely unfold, has further reduced opportunities and resources available for the socio-economic development of cities. The financial crisis has produced an unexpectedly severe contraction in private and public investments, which has in turn resulted in reduced industrial production, a contraction of GDP growth and general stagnation in the major industrialized economies. The aftermath of the economic crisis has been a dramatic increase in unemployment and lowering of salaries for those employed in all sectors, with deleterious effects on the level of internal demand. On

top of this dynamic, the high level of public debt in several countries has led to a sovereign debt crisis and speculative attacks against selected member States of the European Union. In order to avoid financial default, bailout measures have been enforced with the support of the International Monetary Fund and the European Union. In exchange, the countries involved have accepted a set of austerity measures designed to control the public debt through the reduction of public expenditures, which has resulted in further decreases in consumption and the cutting of social welfare systems. Consequently, many European cities are experiencing marked increases in social and economic inequality and a general decline in the quality of urban life.

The challenge at hand is to identify and analyze the potential drivers of socio-economic development that is both sustainable and inclusive. In what follows we present promising examples of a new phase of socio-economic development, seeds of renewed economic vitality and concern for the making of the "human city".

What are some prominent examples of socio-economic development in the city and who are the actors/drivers of this change?

Since 2000s, a rich set of new forms of economic enterprise has developed, especially in the sectors more intensively dependent on knowledge, creativity, and innovation such as those impacted by the Internet and digital revolution (Castells 1996). These unconventional forms of production, in which, with the aid of the Internet, the creative energy of a large number of people is coordinated into large, meaningful projects without relying on traditional hierarchical organizations or monetary exchanges and rewards, has been defined by Yochai Benkler (2006) - partly relying on the work on the traditional commons developed by the 2009 Nobel Laureate Elinor Ostrom (1990) – as Commons-based peer production (CBPP).

Commons-based peer production (CBPP) is a new and increasingly significant model of social innovation based on collaborative production through the Internet. This new model of production is based on distributed, non-proprietary and self-organized cooperative networks.

This production is commons-based because it is not built around the asymmetric exclusion typical of property. Rather, the inputs and outputs of the process are shared, freely or conditionally, in an institutional form that leaves them equally available for all to use as they choose, at their individual discretion. (Benkler 2006). The best known example is the online encyclopedia Wikipedia, a free online encyclopedia that is collaboratively edited by volunteers over the Internet. Anyone can be a contributor to Wikipedia, whose wiki system makes it easy for any reader to modify a Wikipedia page. Since its inception in 2001, Wikipedia has grown to host over 25 million freely usable articles in 285 languages. Its revealed informational value seems to be enormous to society, as it receives more than half a billion unique viewers each month.

The common goods are produced through collective societal innovation processes, which are based on cooperation instead of competition among projects and individuals. The production of goods is the result of voluntary acts of individuals who cooperate freely and organize without monetary reward as the primary incentive. Given the strong impact of voluntary participation the traditional hierarchical structure is replaced by new mechanisms of horizontal, participatory governance (Bauwens 2005).

This principle of social cooperation as a form of organizational governance is now applied to a vast range of projects; from Free Software to Community gardens, from time-banks to Maker projects.

These projects have proven not only to be a source of social value to society, but in many cases have an economic impact as well. Indeed, several commons-based peer production projects have created innovative commercial products, outperforming market-based organizations in economic sectors ranging from Information Technology to the manufacturing sector. For instance, the operative system GNU/Linux is one of the three most popular operating systems (after Windows and the Mac OS), used by millions of people. The success of GNU/Linux is based on the fact that it is a commons that everybody can use, improve and share. Linux is most popular with companies that need reliable servers. It is frequently used for high-performance applications – more than 90 percent of the world's 500 fastest supercomputers use Linux. Another case is the web server Apache, which has been the most widely used web server software in the world since 1996 by companies as well as single users (W3techs, 2015).

Successful examples, however, are by no means confined to the digital world.

Open hardware projects design physical products by freely sharing blueprints, design documents, and bills of materials. In the field of electronic hardware, the Italian Arduino project is especially well known. Arduino is an open-source electronics prototyping platform based on flexible, easy-to-use hardware and software, which is intended for artists, designers, hobbyists, and anyone interested in creating interactive objects or environments. In mid-2011 over 300,000 official Arduino had been commercially produced, and in 2013 over 700,000 official boards were in users' hands.

Another example of commons-based peer production oriented toward the production of physical goods is the automotive company Wikispeed. Wikispeed is a United States automotive manufacturer, a non-profit company with R&D inputs from a global think-tank collaborating using open source licensing. Their modular light-weight vehicle tied for 10th place in the Progressive Insurance Automotive X Prize, outlasting more than 100 cars from companies and universities around the world. Collaboration on new product development is open to anyone in the world, regardless of background, by remote-pairing with an experienced team member and pulling tasks from a team's prioritized backlog of tasks. Team Wikispeed has over 1,000 members from more than 20 countries (Wikispeed, 2015).

This new form of production is driven by the logic of economy of scope rather than economy of scale, creating meaningful products with real value of use. An economy of scope exists between the production of two goods when two goods which share a common cost are produced together such that the common cost is reduced. The effect of an economy of scope is to increase the efficiency of production as a result of increasing the number of different but related products offered. In commons-based peer production, this is mainly achieved by mutualizing infrastructures, both immaterial (open source knowledge, code, design) and material (co-working, fablabs, car-sharing) and using distributed machinery in distributed workplaces to allow local production in micro-factories, through the process of manufacturing on demand, while achieving scope through global immaterial cooperation in the design of the products, the design of the machinery required to produce them, and even the processes through which to make both design and production (Bauwens 2015).

Community-organized production places are rapidly emerging as a global fact. The global Fab Lab/Maker space network spans over 220 laboratories on five continents. These laboratories have emerged as an innovative mix of cultural, technical and co-productive practices; located mainly in large cities, they are modern open workshops whose goal is to produce "almost anything".

These laboratories are on the one hand local nodes of an interconnected global network, and on the other hand the first case in which the practices of the production of collective goods that grew out of the digital sphere moved out to physical production.

In these collaborative spaces, users collaboratively create projects to build solutions to local or global problems. Most importantly, once the product is completed, all the information necessary to reproduce it is shared online through internet platforms. For instance, "eCars – Now!", a project developed by a maker community in Finland, aimed to convert cars with internal combustion engines (ICE) into electric cars by replacing the ICE with an electric motor, together with batteries and all the needed electronics, software and so on. The community created a conversion manual describing the conversion process and released all the information needed for building the components and the software for the control systems and built a prototype vehicle as a model for independent companies to perform such conversions commercially.

This project led to the creation of a very diverse set of local entrepreneurial projects in different countries, which are producing sustainable cars by transforming the original project to fit local needs.

The output of collaborative production is open and can be shared also with traditional economic actors.

In so doing, they are reinvigorating the local economic system.

These knowledge sharing practices and the resulting openness of their products thus have the important effect of allowing the diffusion of innovation and ideas, which in turn is a stimulus to local entrepreneurship and acts as a powerful driver of economic growth.

The possibility of sharing innovation and ideas, combined with the agglomeration of local entrepreneurs and companies around fabrication laboratories, seems a feasible and sustainable way to implement the "smart specialization" growth model proposed by the EU programme Europe 2020, in which the mix between knowledge sharing and local empowerment through new digital technology and local skills can mobilize new resources for the economic development of cities.

As Rifkin (2014) emphasized in a recent book, one might think of a future in which global open design communities could be accompanied by a global network of micro-factories producing locally, following a model such as those proposed by open-source car companies like eCars - Now! and Wikispeed.

4.2 Governance

In contemporary societies, the systems of representation and transmission of social demands are increasingly unable to carry out their functions and have consequently lost legitimacy. Politics tends to lose its ability to govern and this occurs at all levels: local, urban, national and supranational. The weakening of representative democracy and the consequent distancing of the ordinary citizen from institutions is also due to the personalization and spectacularization of elections, increasingly controlled by the media and by rival groups of experts in techniques of persuasion. Several factors are thought to be responsible for this crisis: economic and political globalisation, the growing complexity and differentiation of modern societies and, more recently, the economic and financial crisis. The use of the term "governance" instead of "government" signals the importance of these socio-economic factors of transformation and the emerging tendency toward new arrangements of governing centred on the interplay between state and non-state actors; governance refers to "a negotiation mechanism for formulating and implementing policy that actively seeks the involvement of stakeholders and civil society organizations besides government bodies and experts" (Garcia 2006, p. 745).

In "governance", two opposing trends are emerging. On the one hand we see the rise of modern forms of "oligarchy", economic potentates or techno-structures, that evade any form of democratic accountability and prefigure forms of post-democratic authoritarianism. These are often pro-growth governance structures which rest on shared interests in economic growth between governments and business elites. On the other there is what is defined by the EU as "good governance", where legitimacy depends on the involvement and participation of different associations and organizations of citizens; in this definition a solution to the crisis of democracy is a "return to the people", thus to forms of deliberative and participatory democracy which envision an active role of civil society. The most famous example is

Participatory Budgeting (PB), a different way to manage public money and to engage people in governance processes. It is a democratic process because community members take decisions directly about how to spend part of a public budget. Even though there are many different experiences around the world, it is possible to identify some common aspects of these processes: residents brainstorm spending ideas, volunteer budget delegates develop proposals based on these ideas, residents vote on proposals, and the government implements the top projects. The process was first developed in Brazil in 1989, and there are now over 1,500 participatory budgets around the world. Most of these are at the city level, for the municipal budget, but it has also been used for counties, states, housing authorities, schools and school systems, universities, coalitions, and other public agencies.

As highlighted in the post-democracy *debate,* from the start of the 21st Century we have seen a crisis in representative democracy as citizens come to see the political sphere as distant and dominated by powerful élites. A key aspect of the debate on the crisis of representative democracy is the focus on state and market as regulatory institutions and governance arrangements as the corrective response to both state and market failure. This debate has excluded the role of large corporations and other dominant economic actors (Crouch 2010). The limitations of this approach became particularly apparent during the 2008-2009 economic crisis when state and market proved unable to avoid and respond to the crisis. Attention was then turned to the necessity of including large corporations in the debate on public issues and to the demand for new forms of corporate responsibility.

The crisis in representative democracy stimulates reflection on the procedures aimed at encouraging the participation of citizens. Among these procedures, the literature focuses primarily on direct democracy, participatory democracy and deliberative democracy. Direct democracy denotes forms of direct exercising of power by citizens and has been strongly criticised by Bobbio (1984). Participative democracy, although having points of contact with direct democracy, tends to suggest a kind of coexistence or complementarity with the institutions of representative democracy. Participatory democracy presumes a relationship between society and institutions which involves direct interventions on behalf of the former in the action processes of the latter (Allegretti 2006). Lastly, deliberative democracy is based on two pillars: on the one hand the use of considered debate, on the other the inclusion of all interests and points of view that are touched by the topic of discussion. Deliberative democracy is thus a form of participatory democracy, but its boundaries are more contained and defined. It excludes the employment of pressure activities - carried out by movements or associations - on institutions (which participative democracy seems to allow) and expects a debate to ensue from the different points of view (Bobbio 2007).

The call for public debate and open discussion is confronted with the prevalence of initiatives aimed at improving the ability of urban areas to compete at the global level. In order to be competitive the governance of cities is changed from "*managerialism,* which is about the effective provision of social welfare services to citizens,

to *entrepreneurialism*, which is characterized by pro-economic-growth strategies, risk-taking, innovation and an orientation toward economic interests (Harvey 1989).

Urban entrepreneurialism has caused significant changes over the past years. Within the frame of the prevailing neoliberal ideology, the allocation of spatial, political, economic, and financial resources has been increasingly directed toward policies favoring economic growth at the expense of wider social benefits. Moreover, the imperative of attracting investment and opening opportunities for economic agents has led to recurring waves of de-regulation and privatization. "The growing of social inequality is an inevitable consequence of deregulation, causing the decrease of government welfare programs and greater competition among places" (Fainstein & Fainstein 2013, p. 43).

The challenge for urban policies is to respond to the needs of local communities and at the same to foster economic growth by making the city competitive at a global level. However, inclusive governance processes are under pressure from strong economic-political lobbies that not only are in conflict with less economically powerful interests, but, above all, tend to inhibit the debate on more widespread social demands. In the contemporary field of social forces, urban policies tend to prioritize strong economic interests in the hope that the resulting economic growth will produce benefits for all layers of society and thus solve all social problems. In reality, the former have shown little interest in understanding the real needs of local people or in satisfying social cohesion goals. The concept of the "Just City" proposes a different approach able to combine equity and material well-being with considerations of diversity and participation, so as to foster a better quality of urban life within the context of a global capitalist political economy (Fainstein 2009).

Which actors and governance processes are able to promote economic development and social cohesion in contemporary city? Can urban governance processes be in the same time democratic and efficient?

In the last twenty-five years several governance patterns have developed with different degrees of pluralism with respect to the actors involved and varying levels of cooperation and effectiveness among them. In general, it can be said that the number of players has grown considerably over the course of time and, alongside local governments, a number of associations, enterprises, civic society enterprises, volunteers associations, and citizens have begun to get involved in politics and started playing a role in the decision-making processes (Pichierri 2014). Inclusiveness and participation confer legitimacy to urban governance processes: in fact, in participative and deliberative dialogues with local communities the needs can be better identified and understood, so that in defining strategies able to satisfy them it is also possible to contrast forms of inequality (Davoudi 2014; Healey 2012, 2014). These governance patterns have had some success, thanks also to the stable or growing legitimisation of

the players that formed them, and have contributed to the improvement in the positioning of the cities that adopted them.

However, legitimacy and representativeness continue to be burning issues, and governance processes that are open and able to take into consideration the different interests and voices remain fraught with difficulties — so much so that with the growth of social complexities and inequalities these difficulties may come to be seen as increasingly unmanageable; in this vision a critical scholar like Swyngedouw (2010) argues that "while the city is alive and thriving at least in some of its spaces, the polis, conceived in the idealized Greek sense as the site for public political encounter and democratic negotiation, the spacing of (often radical) dissent, and disagreement, and the place where political subjectivation emerges and literally takes place, seems moribund. ...The 'political' is retreating while social space is increasingly colonised by policies (or policing)". In these post-political conditions politics becomes a sort of Ground Zero, but with little chance of being re-built.

Other scholars are more optimistic about the possibilities of democratic rule and point to a number of events and emerging processes and phenomena that are gaining impetus and represent counter-tendencies to the demise of democracy. These are seeds of change in the direction of participation and inclusion in urban governance. Three main areas of practices are discussed here: ICT technologies, civic society organizations and urban social movements.

The most promising projects are connected with ICT technologies and with the role these can have in facilitating processes of inclusive governance (Deakin 2014; Deakin 2015; Giffinger 2014; Giffinger 2015; Hollands 2014a; Hollands 2014b; Komninos 2014; Schuler 2014; Townsend 2014). Other phenomena concern the role of non-profit organizations or civic society enterprises that promote activities and services that are not provided by the state (Healey 2014; Hollands 2014a;); others still are connected to urban social movements (Hollands 2014a; Hollands 2014b; Novy &Colomb 2013).

The debate on the *digital divide* has shown that, while it is true that new technologies can contribute to improving people's quality of life in general and in specific in terms of the construction of more democratic governance processes, it is also true they can become new factors of exclusion and challenging obstacles if people do not have the possibility to learn how to use them. All analysts of the role of new technologies in the processes of governance have highlighted that, for new technologies to contribute to the inclusiveness of the governance process, it is necessary that people develop skills that enable them to appreciate their potential (Deakin 2014, 2015; Giffinger 2015, Komninos 2014 and Schuler 2014). Important words on this point come from Komninos (2014), who mentions the construction processes of local spatial intelligence, through the development of capabilities of the people who use them. In the smart city and smart governance literature, the discussion is centred around the pervasiveness of new technology and the necessity to create the basic conditions for improving citizens competencies and capabilities. In that direction an interesting contribution is offered by "civic hackers", i.e. "*citizens developing their own*

*applications which give people simple, tangible benefits in the civic and community aspects of their lives (*Townsend 2014). Civic hacking is a way of being and a way of doing that is the result – and in turn the condition -- of diffuse learning processes.

New technologies are contributing to the inclusiveness and democracy of governance procedures based on social networks where the combined effort by public and private actors encourages new urban policies . In this regard an interesting example is provided by the Dutch platform OSCity. OSCity is an example of a broader current in which artists, citizens, NGO's and business actors have built online tools to visualise all kinds of data, varying from open government data to collaboratively produced data sets focused on community issues like environmental pollution. What makes OSCity interesting is that it allows users to intuitively map various datasets in combination with each other in so-called 'map stories'. For instance, a map of empty office space can be combined with maps of urban growth and decline, the average renting price per square meter of office space, as well as a map that displays the prices of houses for sale. There is an important lesson we can learn from the OSCity project, as it shows the importance of making open data platforms available and easily usable for various actors. Another noteworthy initiative promoted by volunteers is provided by the 596 Acres project in New York, as recalled by Hollands 2014a, as a project designed to turn Brooklyn's 596 acres of publicly owned land into an area fit for shared use by a range of community groups and individuals; its IT online platform, effectively a 'knowledge commons', has been crucial in building this intervention. In the end, another fascinating experience is the FoodHub project (https://food-hub.org/) promoted by Ecotrust (conservation organization) in Portland, Oregon. The FoodHub is open to commercial buyers, independent producers, regional distributors, plus media, industry suppliers, farmers' market managers, trade associations and non-profits, in California, Oregon, Washington, Idaho, Montana and Alaska.

Our final example concerns research, specifically PUKAR Partners for Urban Knowledge, Action & Research. This organization is working on a public campaign initiative for infrastructural facility towards universal internet access in Mumbai. PUKAR aims to democratize research and broaden access to knowledge among disenfranchised or weakly institutionalized groups and to create a space from which their non-traditional and non-expert knowledge can contribute to local, national and global debates about their own futures. PUKAR is designed to complement, on the social and cultural side, the current growth in technology-driven knowledge initiatives in India (http://pukar.org.in/).

In recent years in European cities, civil society enterprises, associations and organizations have begun to play an expanding role in the provision of services and in local development as formal government reorganizes and retreats (Healey, 2015a). Rather than forms of citizen 'participation' in public policy, these enterprises are involved in the direct provision of goods and services through citizen-generated initiatives. They respond to the deficiencies arising from financial and organizational constraints of the public sector and from inadequacies in the quality of market delivery of welfare services. They also reflect a search by citizens for more locally-sensitive

provision of goods and services. Two examples from relatively successful ones have emerged in the past two decades: The Ouseburn Development Trust; The Low Impact Living Affordable Community (LILAC) LEEDS (Healey 2015; Hollands, 2014). The Ouseburn Trust grew out of protests against waterfront regeneration in Newcastle in the early 1990s; the protest group was transformed into a Charitable Trust in 1995, working closely with City Council officers. Notwithstanding the tension among the original activists and city council, the Trust is an important locus where the interests of the local community are first debated and then promoted in the city council (Healey 2015). LILAC stands for Low Impact Living Affordable Community and designates a housing project in Leeds which has provided ecologically sustainable housing, as well as encouraging cooperative community-based living (Hollands 2014a). It consists of 20 homes and a shared common house, all built to ensure high energy efficiency. The site was provided by the City Council. Careful attention has been given to green spaces, including children's play areas and allotments for those who want to grow vegetables. It is run as a not-for-profit co-operative in the form of a Mutual Home Ownership Society; this organisation owns the homes and the land, which are then leased to members with lease arrangements varying with individual members. All members are involved in management, through regular meetings and task teams, with a smaller Board keeping an eye on legal and financial issues.

Urban social movements (USMs) have played an increasing role in contesting neo-liberal policies and defending citizen interests. Several authors have identified (in the German and North American context) new types of urban movements for social and environmental justice that have begun to challenge the consequences of neo-liberal policies in various fields (Mayer 2009). They bring to the political sphere alternative discourses and narratives regarding the future of the city. A good example is the US-based 'Right to the City', a coalition of community-based groups united in their opposition to neoliberal economic and social injustices http://righttothecity.org/. Another example is Occupy Wall Street http://occupywallst.org/ (Harvey 2013). Other interesting practices concern what we call 'place-based' urban social movements. Novy and Colomb (2010) discuss the impact on local policies of experiences in Berlin and Hamburg of two urban movements opposing urban projects based on the instrumental use of arts, culture and creativity in regeneration and city marketing policies (Novy & Colomb 2010).

4.3 Social cohesion

Contemporary societies are affected by increasingly disruptive dynamics whose effects are particularly prominent in cities; these dynamics are set in motion by a very diverse and complex set of economic, political and social factors that in different ways undermine the integration of individuals and groups in society and the collective making and functioning of the city.

Social cohesion concerns society as a whole, at multiple spatial scales, beyond issues of inequality, exclusion and inclusion, and across public, market and voluntary sectors. It has, however, a crucial local dimension: local actors are playing an increasingly

important role in determining the mix of formal and informal services provided by public and private actors, which are integrated in different ways at the local level. It is therefore in cities, where multiple and often conflicting disintegrative dynamics take place, that regional and municipal administrations are called upon to assume increasing responsibility for local development and social cohesion. Having assumed state functions, cities become arenas where decisions on societal issues of crucial importance for social cohesion are taken through more or less democratic decision-making processes (see governance section). On the other hand, cities are also places where innovative solutions to the problems of social cohesion may materialize.

At present, social cohesion is a burning issue because of the failure (or problems in the functioning) of the labor market, the family and social networks, and the state to serve as effective integrative mechanisms.

As far as the labour market is concerned, processes of de-industrialization and de-localisation of production have left cities with high levels of unemployment as a longstanding feature; the experience of unemployment entails a process of social disaffiliation, including low morale and damage to personal confidence and self-esteem, which weakens the individual's sense of community belonging (Ambrosini, Coletto & Guglielmi 2014). Apart from the process of exclusion from work, within the labour market there has been a reduction of wages and a worsening of employment conditions as a result of the competition among cities to attract and retain investment; temporary work contracts, low wages and inferior conditions have become particularly common amongst younger people, female workers and immigrants. This increasingly large set of precarious workers is spatially dispersed in the city and highly diversified; the consequent inability to find effective representation in the public sphere serves to lock them down at the margins of society.

At the same time, the upper level of the social structure has been expanding thanks to the growth of specialized and high-income jobs, mainly brought about by the financialization of urban economies. These two combined processes have created unprecedented levels of inequality in the contemporary city (Piketty 2014). Polarization and inequality are reflected spatially in terms of segregation; the rise of segregation is revealed by the increasing emergence of areas of deprivation and exclusion alongside privileged areas where public and private investment is concentrated, so that the city has lost its unity and is fragmented into separated "worlds" of very different life experiences and trajectories.

As far as public institutions are concerned, social inequality and different forms of social exclusion have traditionally been contrasted by the provision of public services, such as healthcare and education under universalistic principles. In the present economic crisis, there are much fewer public resources for the welfare system, particularly in relation to increasing demand for social protection. Existing standardized access and provision has proven far from adequate in meeting the growing needs of increasingly diverse social groups whose labor market position and individual demands have become more heterogeneous. Welfare systems today are

particularly unable to provide for the fundamental need of housing, while the economic trends outlined above have increased this need, not only for the growing quota of poor families but also for low and middle income groups who face difficulties in paying increasingly high rents and mortgages (Andreotti, Mingione & Polizzi 2012).

Finally, traditional institutions of integration such as family and community have lost their capacity to include individuals into stable and meaningful networks of relationships and well defined identities. The family has traditionally functioned as a protective buffer for the individual due to its capacity to pull together, through the family network, material and immaterial resources in support of its members. As a result of social and demographic trends such as aging, a decreasing number of marriages and births, increase in divorces, decrease in family size, the rise of single-person households, etc., this capacity has been substantially reduced (Saraceno 1998). Furthermore, the increasing flexibility of lives becomes the general trait of modernity, as people more easily and more often change places, jobs, spouses, values, excluding themselves from traditional networks of support (Bauman 2000). Additionally, local communities are constantly changed by patterns of physical mobility by which individuals lose their sense of belonging to larger collective identities. As social relationships are increasingly characterized by uncertainty, individuals experience increasing isolation, exclusion and disaffiliation from their social context.

What are the social practices that both enable innovation and increase social cohesion in the city?

Urban social cohesion has been strengthened by social innovation practices which have emerged as part of the effort to counteract these exclusionary tendencies. Social innovation can be defined as the satisfaction of human needs (unmet by either the market or the state) through the transformation of social relations. For instance, innovative housing practices such as co-housing and self-building represent a response to the crisis of the welfare system (Vranken 2004). Semprebon and Vicari have studied a case of self-building in a small-medium sized town in the metropolitan area of Milan; the self-builders belonged to low-income families of Italian or immigrant origins with no access to the private rental market or the social housing sector; in this case, the sharing of the construction work among participants gave them access to housing. Self-building proved an effective answer to the material need for a dwelling at a below-the-market level. By finding innovative solutions to the problem of housing in large cities through the creation of new social ties, such innovative practices respond to material needs and to the dynamics of social isolation and fragmentation.

Often these innovative practices are able to transform the governance systems that guide and regulate the allocation of resources by establishing new governance structures, such as allocation systems. For instance, urban agriculture addresses urban food provision and food rights, individual and communal health, urban and peri-urban environmental quality and socio-environmental justice, regardless of the social background of the participants (Tornaghi 2014). Urban agriculture practices have not only been granting access to urban land for the recreational and food production needs

of immigrants and other food-insecure populations, but have been systematically challenging the concentration of land, and other inequities embedded in the dominant agriculture and food systems, such as environmental impact, health hazards and the exploitation of workers (Gottlieb & Joshi, 2009).

The emergence (and consolidation during the 2000s) of the so-called Gruppo di Acquisto Solidale (GAS, which could be translated as Solidarity Purchasing Group, or SPG) is a remarkable example of how new practices of consumption can also serve as powerful tools for social cohesion. SPGs are "local networks of people who organize consumption decisions following specific solidarity criteria with respect to the environment (e.g., buying environmentally friendly products, i.e., seasonal, organic, locally manufactured, etc.), to producers (by creating primarily social bonds, they often reduce the profit maximization imperative that guides mainstream capitalism), and to SPG members themselves (by collectively sharing the burden of order and delivery of the products, providing mutual assistance in case of need, tutoring the newcomers, etc.). The main concern is to collectively organize consumption activities by following shared solidarity rules primarily regarding environmental and social justice concerns" (Graziano & Forno 2012, p. 123).

These groups emphasize "solidarity," promoting greater social and environmental sustainability, by trying to re-embed economics into social relations at the local level and stressing the need to reorganize economic life on the basis of human and social needs (Graziano & Forno, 2012). In doing so, they allow low-income families to access high-quality food while helping to build a new set of relationships among neighbors and with local producers.

Social innovation transforms the social relations in space through the reproduction of place-bound and spatially exchanged identities and culture (Miciukiewicz Moulaert Novy Musterd & Hillier 2012). The increasing diffusion of spaces of making or local laboratories for goods repair speaks of the transformative potential of social relations through the joy of making and the re-building and sharing of artisan know-how (Gauntlett, 2011; Sennett 2008). The artisan shared laboratory is a social space that primarily builds social ties among people which allow the sharing of knowledge and skills (Sennett 2008); as such it is also a space where people, by developing the ability to create objects, gain autonomy and recognition.

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